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JULY, 1906.

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$3.00 with Directory.

TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

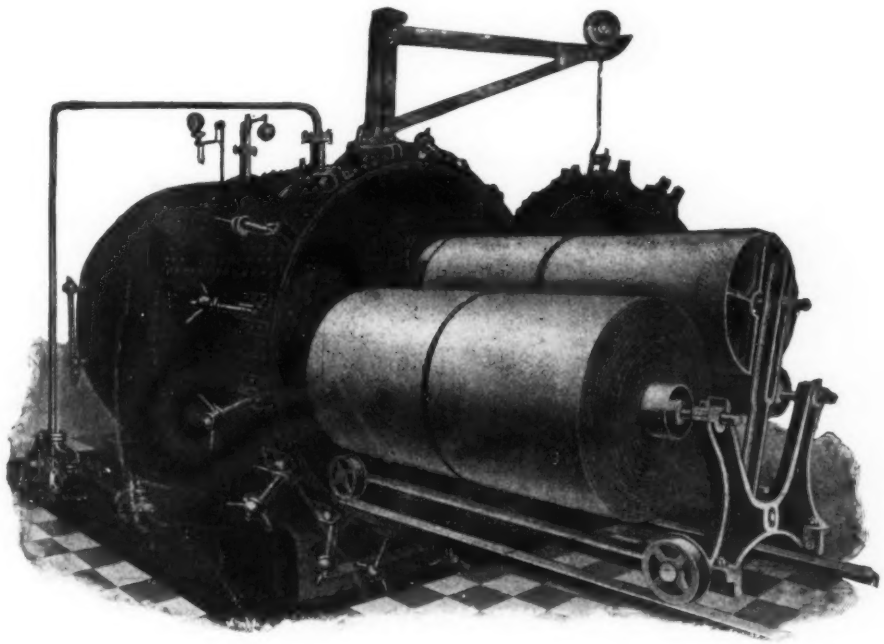
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

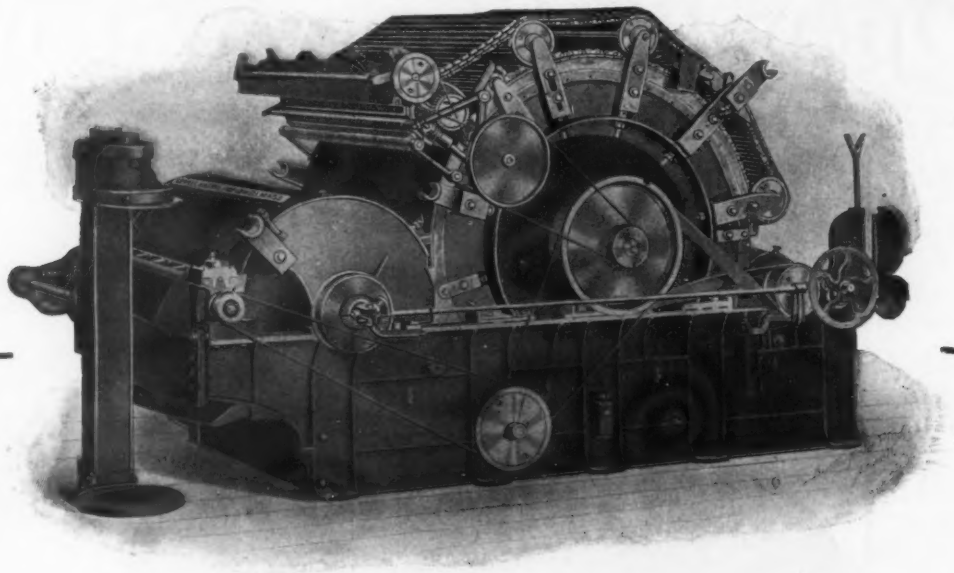
Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

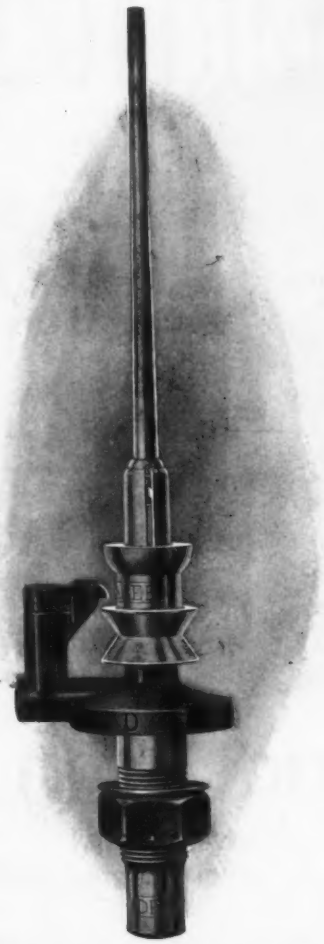
Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

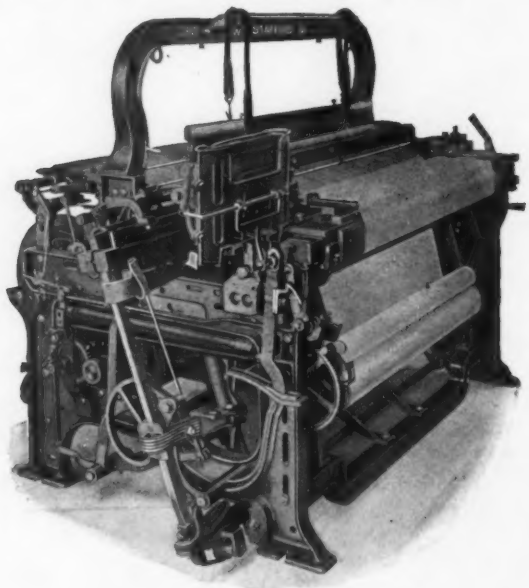
Draper Company, Hopedale, Mass.

We Also Build Looms.

THE GEO. W. STAFFORD COMPANY

WEAVING MACHINERY

READVILLE, MASS.



Ideal Automatic Loom

History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation:

Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

Write for further particulars

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

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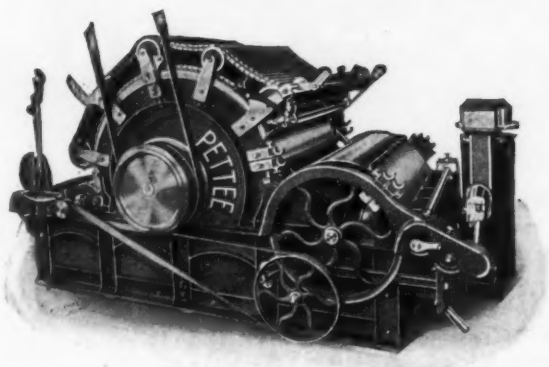


Pickers,
Revolving
Flat Cards,
Drawing
Frames,
Railway Heads,
Slubbing,
Intermediate
and
Roving
Frames,
Spinning Frames,
Spoolers
and
Reels.

Shops—

Biddeford, Me.

Newton Upper Falls, Mass.

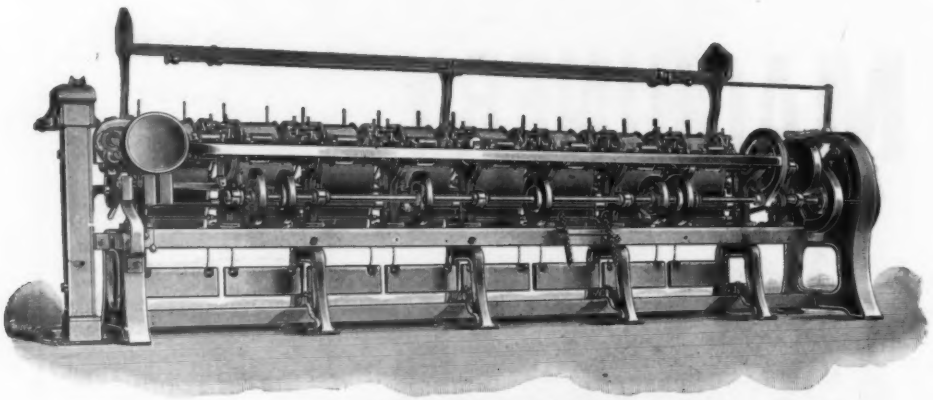
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

"Kitson Products"

Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

Raw Stock Cotton Dryers

We own the Patterns and can furnish REPAIR PARTS for PICKERS
formerly built by

WHITEHEAD & ATHERTON, . Lowell, Mass.
ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

SCOTT & WILLIAMS

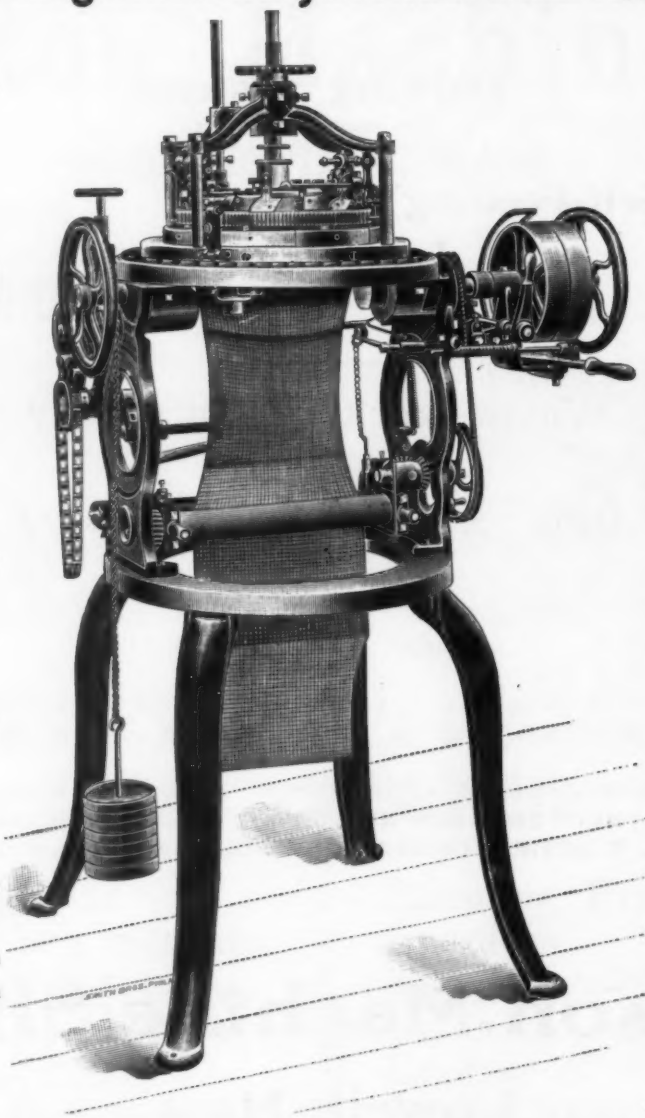
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

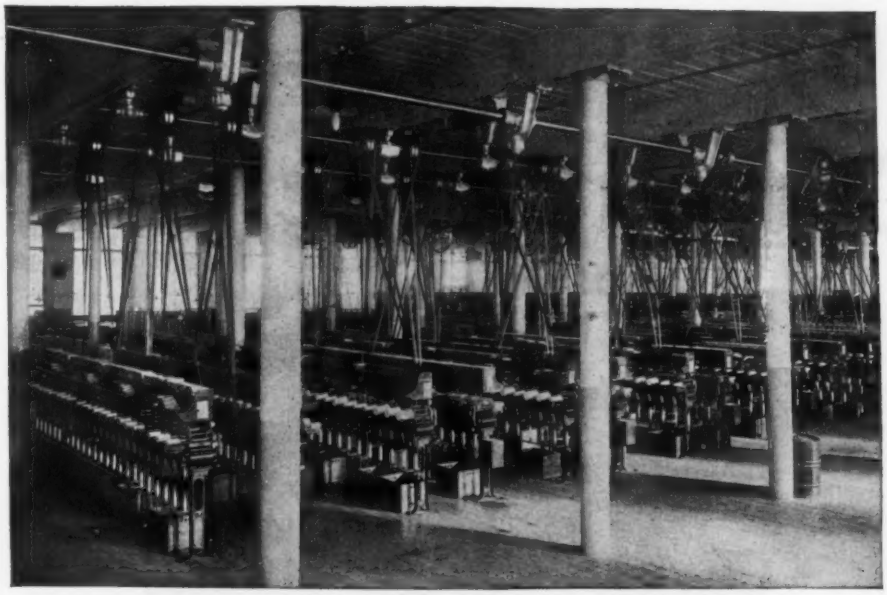
We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.



A 600 spindle universal mill equipment with interchangeable parts for coning and tubing — capacity 40,000 lbs. soft wound cones per week on No. 18s Hosiery Yarn — one of many installations of

Our No. 50 Self-Oiling Winding Machine

A universal machine in every respect

The pressure applied in winding is very light, decreasing automatically as the cop increases in diameter.
There is absolutely no crushing, crinkling, or stretching of the yarn and no rolling or slipping at the ends of the traverse.
Produces the most compact and attractive package which delivers perfectly — with uniform tension in unwinding.

We have equipped many knitting mills to wind yarn for their own use with our No. 50, after tests made for cost of winding and quality of product against the latest drum winders. Why not investigate for yourself?

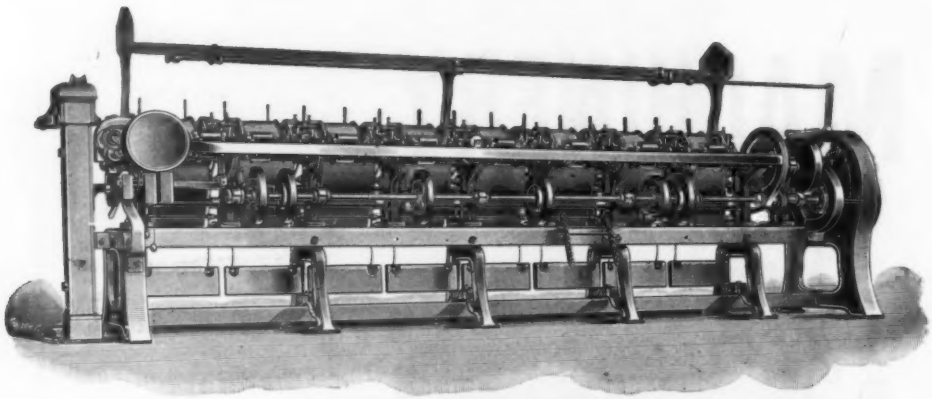
Universal Winding Co., Boston, Mass.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



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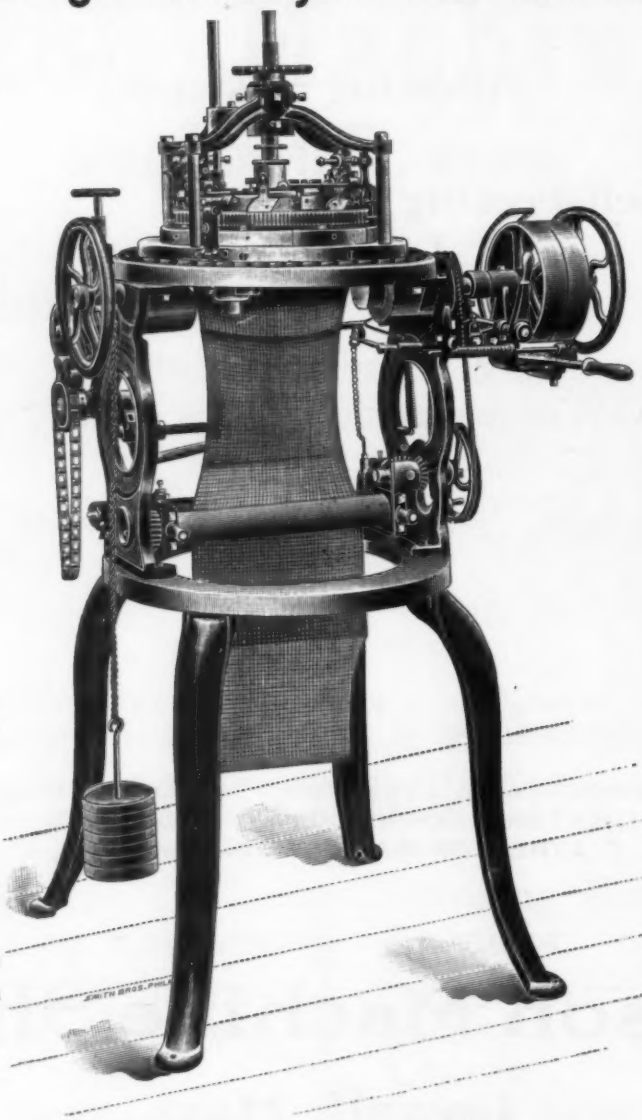

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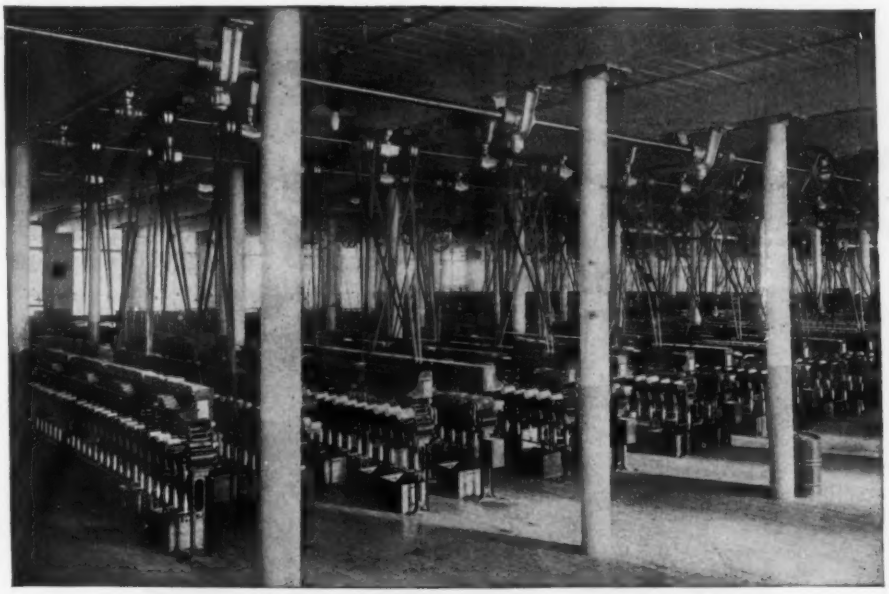

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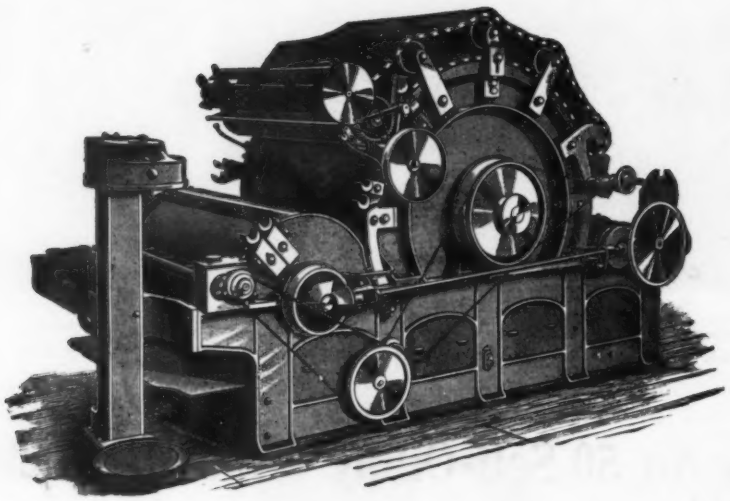
Universal Winding Co., Boston, Mass.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING

Plain and Fancy Silk Looms

Southern Office, Charlotte, N. C.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

GEORGE HODGSON, LTD.

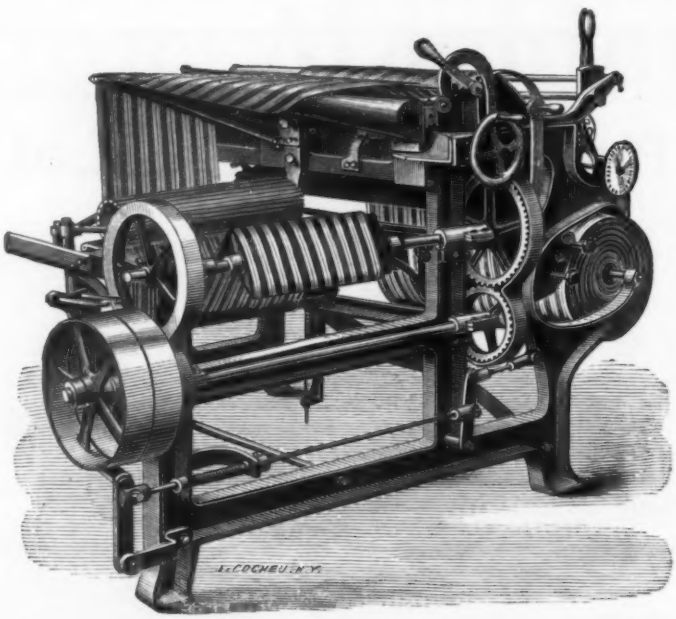
Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

Identify your name with your goods



by using this machine to print name or trade mark on the selvedge. Prints yardage at same time, doing away with shortage claims.

Bringing your name or trade mark directly to the attention of the consumer creates a constantly increasing demand for your product. The consecutive printing of yards and quarters is a sure cure for losses and annoyance incident to claims for shortage. Handles all kinds of Cottons, Woolens, Silks and Carpets wide or narrow. Let us send you full particulars—they will be interesting and profitable.

Parks & Woolson Machine Co.,
Springfield, Vermont.

Formerly built and sold
by the Fabric Measuring & Packaging Company, New York City.

Jacob K. Altemus is

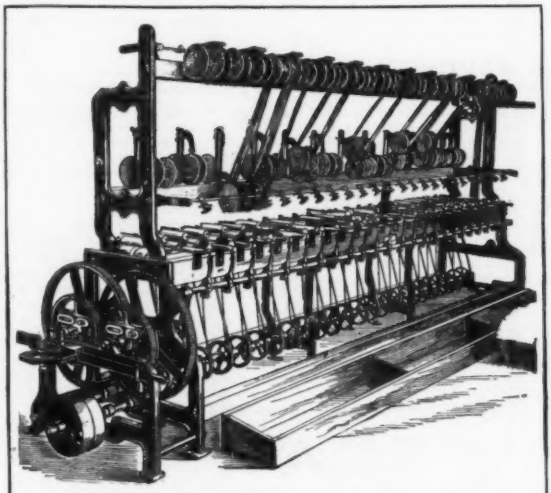
Able to supply the best

Cop Winding Machinery

Or Hosiery Winders and more in particular

Bobbin Winders,

Keep in mind that I



The Greatest Bobbin Winder for Skeins Ever Built.

Always produce machines that are right

Letting nothing go out

That is not satisfactory before delivery.

Every

Manufacturer should investigate warping and beaming machinery, warp splitting as well,

Upright Spoolers, Quillers, Warpers, Twisters, etc.

Send for full information and prices.

Textile Machinery

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HARWOOD'S MACHINERY

Increases Production, Improves Quality, Decreases Labor Cost.

THE BRAMWELL SELF-WEIGHING FEEDER,

For Woolen, Worsted, Hosiery and Shoddy Cards and Garnett Machines.

We began introducing this feeder more than twenty years ago and its use is now practically universal. Many other types and makes have been tried and discarded, but the Bramwell, in its improved and up to date form, is now recognized everywhere as the most perfect feeder and only complete feeding machine in the world.

Our long experience has proved conclusively that where evenness is required—determined by weighing—our weighing feature is absolutely indispensable. Several attempts have been made to introduce feeding machines ignoring this principle, but none have succeeded.

We have made a careful study of all phases of the feeding problem and by adaptations and modifications of the Bramwell Feeder to meet the particular conditions, are prepared to feed evenly all kinds of stock from rabbit's fur to jute tow, including shoddy, cotton, fine wool, mixtures, fine and coarse worsted, flax tow, long worsted and all other kinds of stock.

THE APPERLY FEEDER,

For Second Breaker and Finisher Cards.

This machine was originally brought to this country and introduced against great opposition by the founder of this concern, the late Geo. S. Harwood. Today there are about 15,000 machines of our construction running in this country and Canada. We have greatly improved the machine. It is today an efficient, positive and up-to-date feed, and we can offer manufacturers the choice between the KEMP POSITIVE GEARED TRAVELER and the STANDARD TRAVELER with all other recent improvements.

THE BRAMWELL PICKER FEED,

For Burr Pickers, Mixing Pickers, Fearnaughts and Lumpers.

We consider our improvements in picker rooms of the utmost importance for up-to-date manufacturers. In fact, wide awake manufacturers are more and more realizing the wisdom of bringing their stock to the card room in a better state of preparation. Hand feeding is becoming a thing of the past in the picker room as in the card room. The latest Bramwell Picker Feed is built to handle all kinds of stock in any quantity with evenness and without injury to the staple.

THE SPENCER AUTOMATIC STOCK OILING MACHINE.

This is a modern device for oiling the stock automatically on its way to the picker from the BRAMWELL PICKER FEED, superseding the wasteful, dirty method heretofore in use. Because of the accuracy of this method and the fact that the oil goes on the stock only (instead of the floor and walls) there is a large saving of oil, and the stock is at the same time more evenly oiled and much better prepared for the carding process.

THE MODERN BRAMWELL FEED FOR WOOL WASHERS AND WOOL DRYERS.

The scouring and drying of stock is today recognized as a very important part of the manufacture of textiles, especially in worsted mills. Our feeds are recognized as the standard for properly feeding stock in the grease or wet stock with absolutely no injury to the staple, with evenness and in sufficient quantity and in the best possible condition for economical scouring. There have been other feeds offered for this class of work, but after clogging up and giving all kinds of trouble most of them are today in the scrap heap, having been replaced with our feeders.

REPAIRS AND IMPROVEMENTS FOR OLD FEEDERS.

We have not been standing still all these years and the feeders we are building today are modern and up-to-date but these improvements and attachments can be placed on older feeders of our construction, greatly to their benefit. We do not hesitate to claim that **no outlay will show a greater return** to a manufacturer than money spent in bringing your Bramwell and Apperly Feeds thoroughly up-to-date.

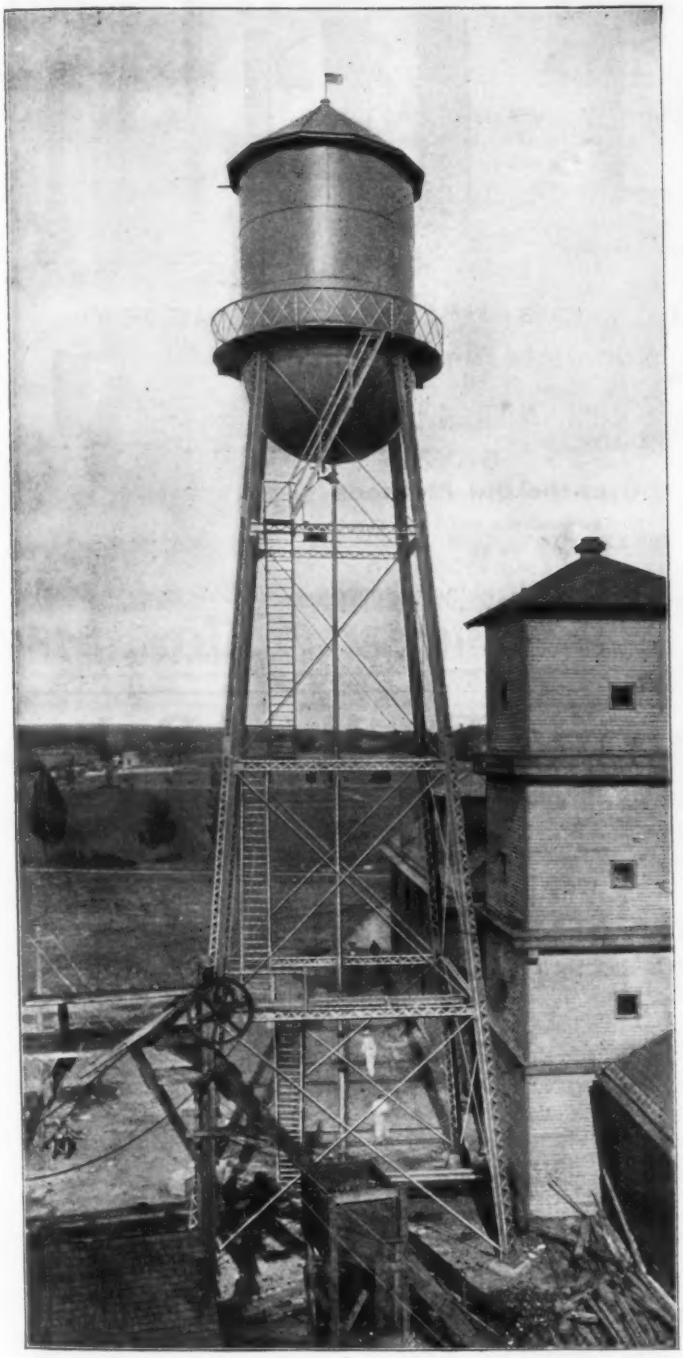
APRONS OF ALL KINDS FOR BRAMWELL FEEDERS.

We build about thirty different styles of spike aprons adapted to the various kinds of stock BRAMWELL FEEDERS are called upon to handle. Our policy is and will be to put into our aprons the best materials and workmanship money can buy. We know we could make cheaper aprons by using cheaper materials and less expensive labor and it would take manufacturers some years to find us out. The apron would LOOK nearly as well but would WEAR only two or three years, instead of from five to ten or twelve. Do not trust the man who says he can sell you aprons cheaper than we can. He can do it (and so could we) but you pay the bill in the end. The best is none too good and is the cheapest in the long run.

Call on us for particulars and information about all matters relating to Feeding Machinery.

GEO. S. HARWOOD & SON,

53 STATE ST., BOSTON, MASS.



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Water Towers

Are furnished by

Tippett & Wood

They provide a storage for water under pressure, and are valuable for fire protection and personal uses

The T. & W. Towers do not fall or leak.

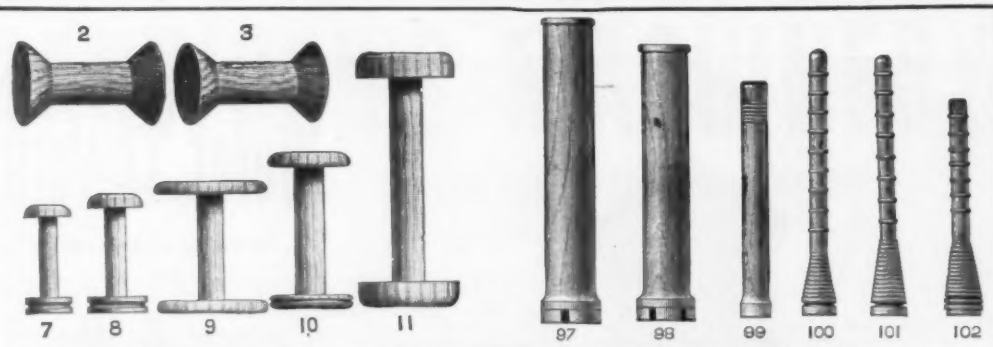
All Sizes Built

Plans and prices given on application.

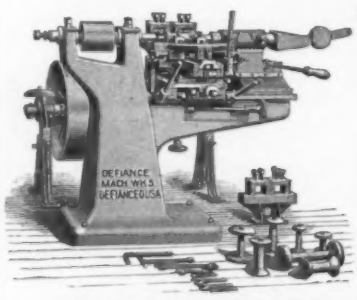
Address

Tippett & Wood

Phillipsburg, N. J.



SPOOL AND BOBBIN MACHINERY



AUTOMATIC SPOOL TURNING LATHE

Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
Defiance Machine Works,
DEFIANCE, OHIO

AUTOMATIC BOBBIN LATHE

Making Endless Belts.

Skiving and gluing is one way to make endless belts, but it's a mighty slow and old fashioned one when compared with the work of the

Jackson Belt Lacer.

With it a 5" belt can be made endless in less than three minutes at a cost of one cent for the lacing (larger belts in proportion). That is quite an improvement, isn't it? Well, just let us add that belts laced in this manner may be shortened or lengthened in a few seconds, and as often as desired, so that you not only save time and money, but your belts become interchangeable and can be thrown from one machine to another to meet any emergency.

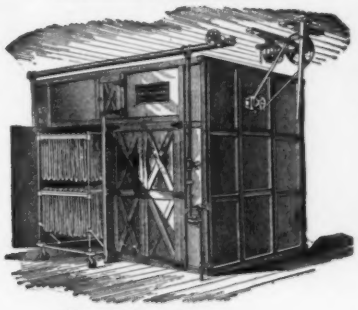
SEND FOR BOOKLET—READ IT AND YOU'LL BE COMING TO BUY A MACHINE.

Birdsboro Steel Foundry & Machine Co.,
Birdsboro, Pa.

"HURRICANE" DRYERS AND FANS

Power Screw, Hydraulic and Lever **Presses**

For Wool, Cotton Stock, Yarn, Stockings, Underwear, Etc.



Truck Yarn Dryer.

BELT DRIVEN AND MOTOR DRIVEN

"Hurricane" Fan, Style No. 2. Write for Catalogues.

COMPLETE EQUIPMENTS FOR DYEING, SCOURING, BLEACHING, CARBONIZING, OXIDIZING, CHROMING, Etc.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. LEEDS. England.

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

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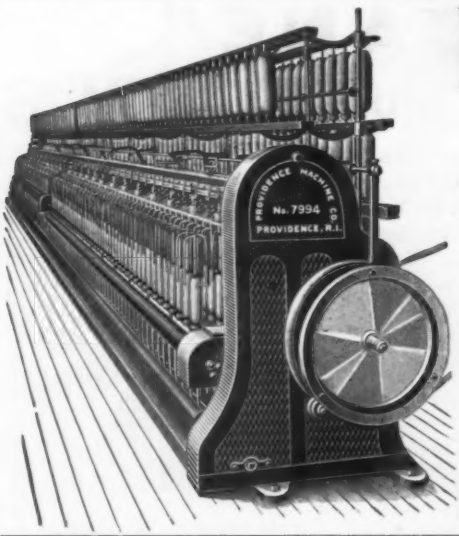

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Manufacturers of

Improved Cotton Roving Frames

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An Essential to the Weave Room

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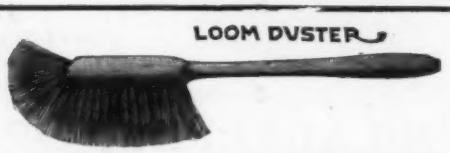
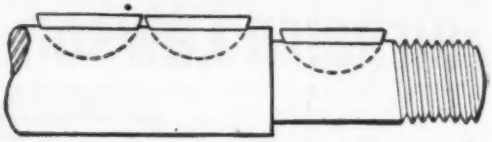


The Loom Duster

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

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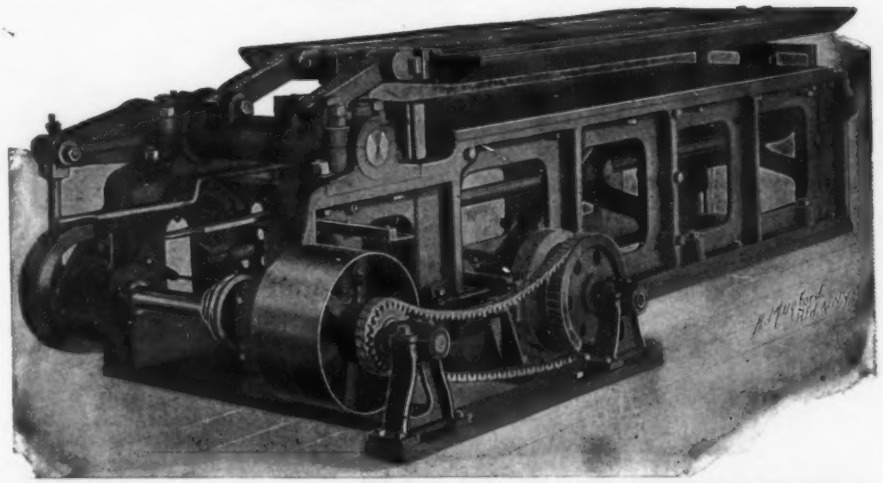

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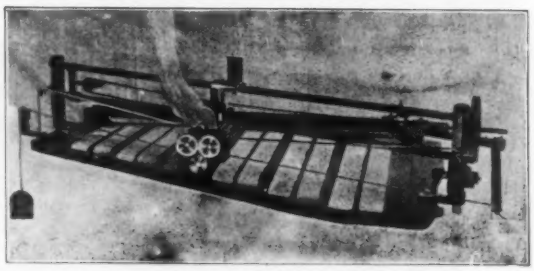
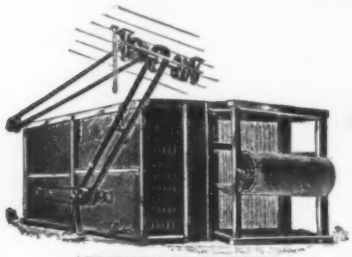


WEB FEED.



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We Recloth or furnish New Metallic Toothed Cylinders and Feed Rolls.

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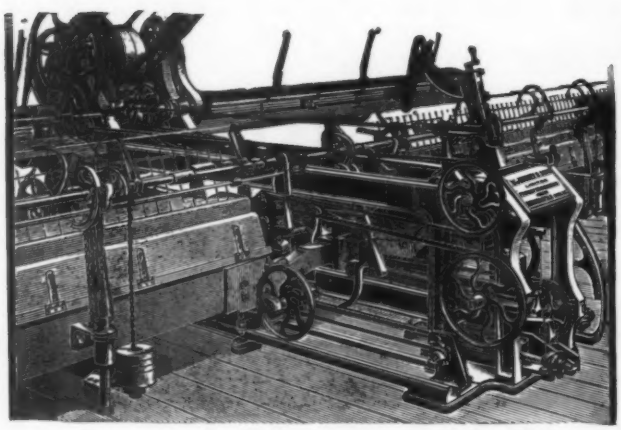

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We build fans for every practical purpose, also heating coils.

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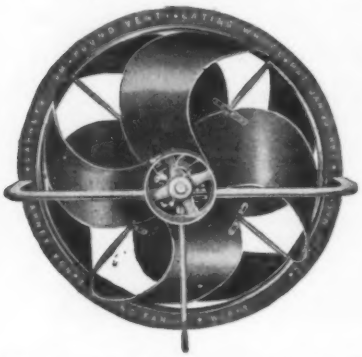
Barney Compound Ventilating Fans Ventilate, Purify, and Dry.



Notice the compound feature—it does the work. They force out all atmosperic impurities and draw in pure air. They often double capacity of drying rooms, expel loose steam from dye houses—preventing condensation, *cool spinning rooms.*

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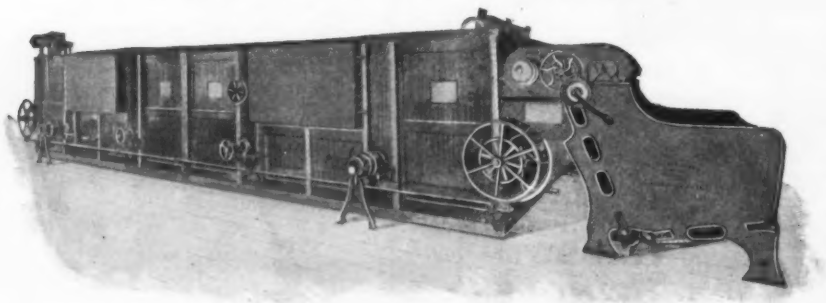

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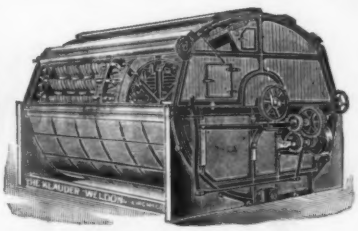

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THE KLAUDER-WELDON DYEING MACHINE COMPANY

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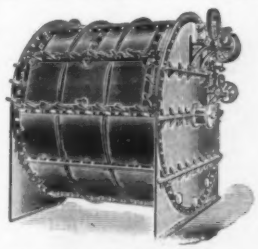
Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



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WILL EARN THEIR COST IN
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IN FROM
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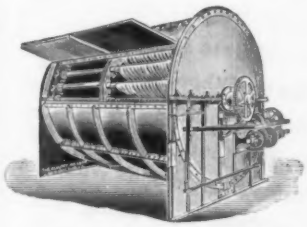
ACCORDING TO CAPACITY



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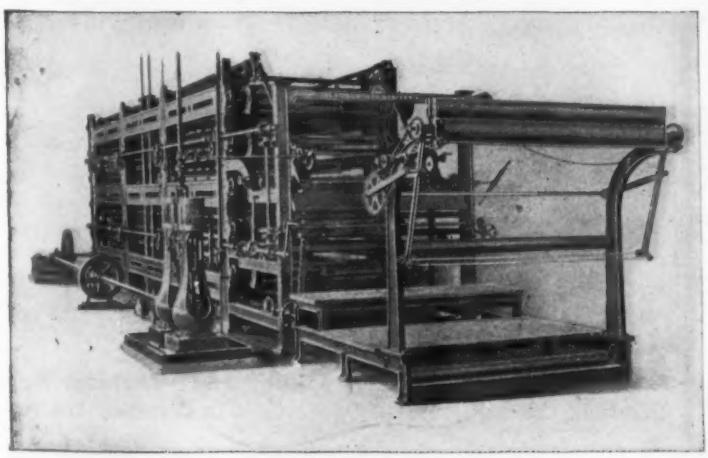
WITH LOW DOWN FEED. **PATENTED FEBRUARY 26, 1895.**



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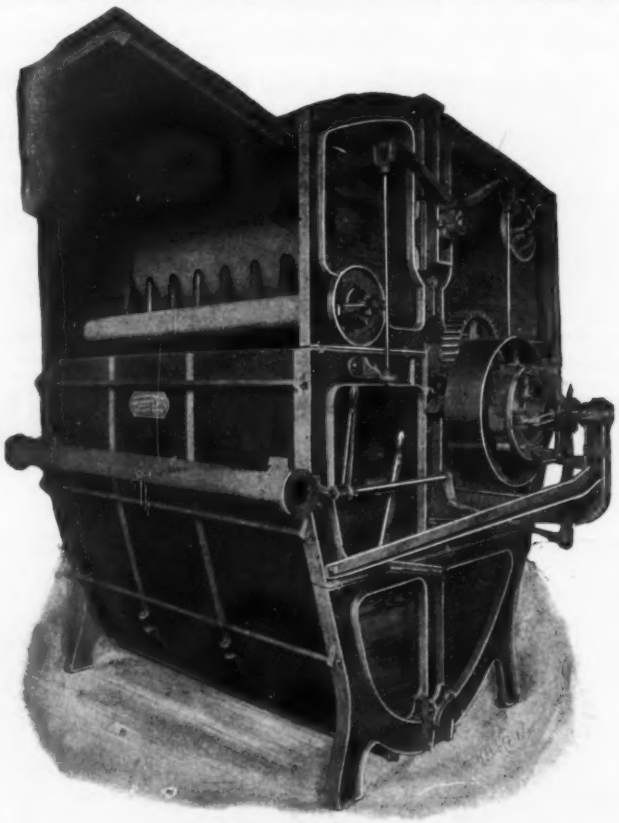

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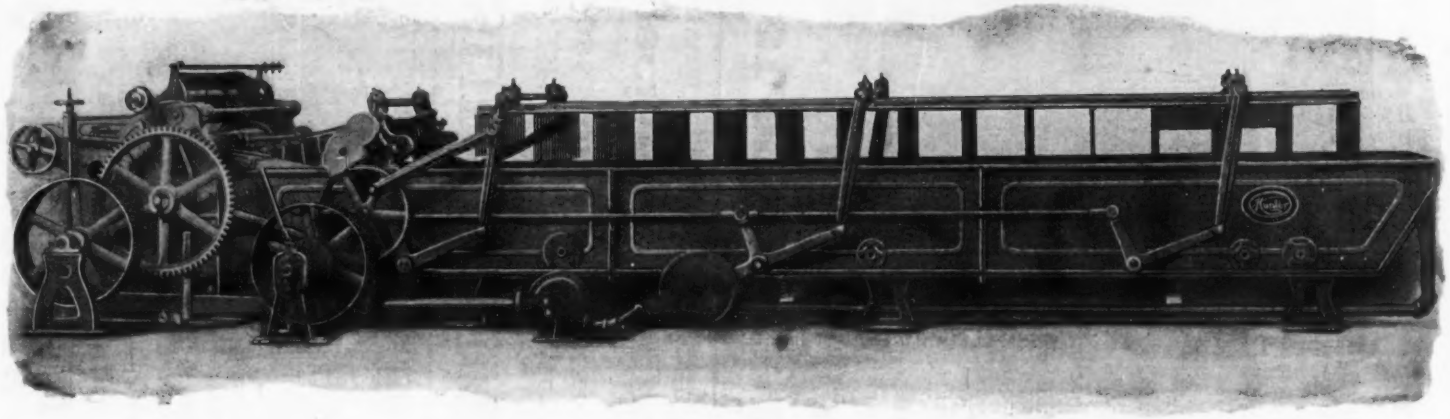

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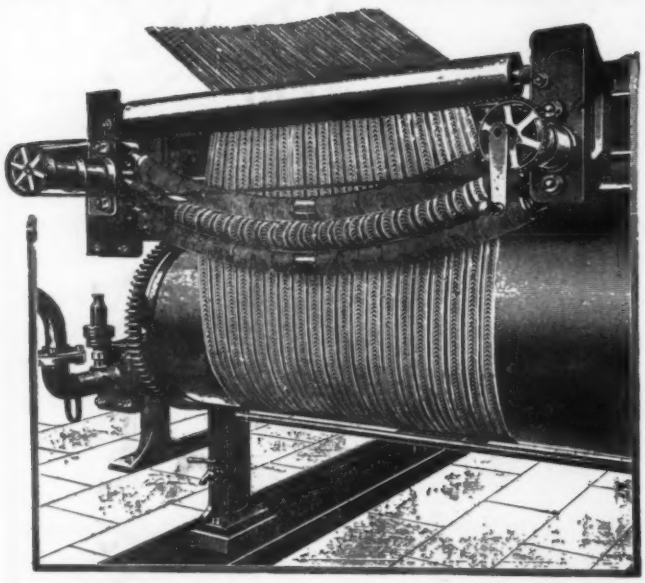

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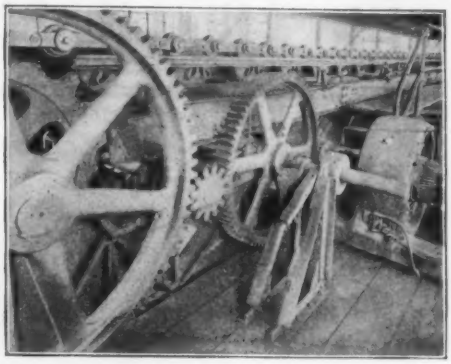

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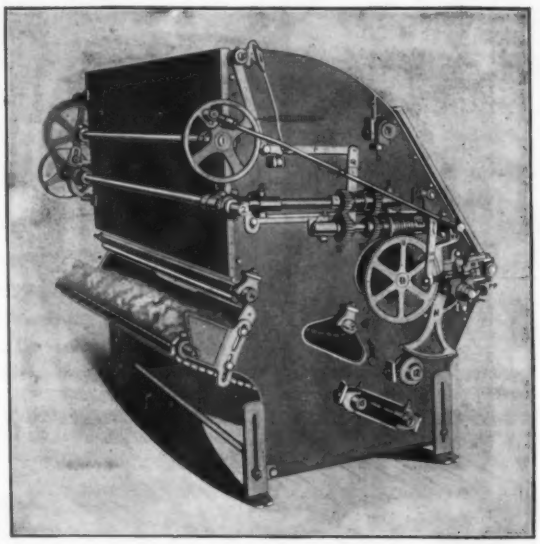

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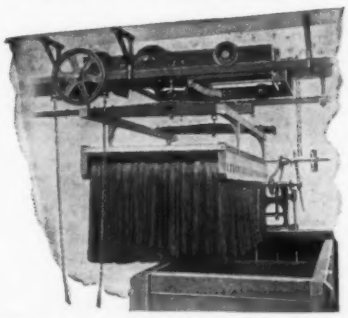
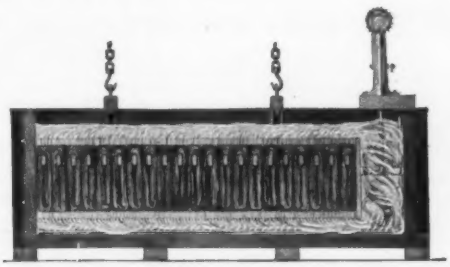
THE ONLY MACHINE THAT WILL DYE SUPHUR BLACK SUCCESSFULLY.



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation

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Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
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Requires but Little Power to Operate.
Leaves the Yarn and Slubbing it its Natural Condition.

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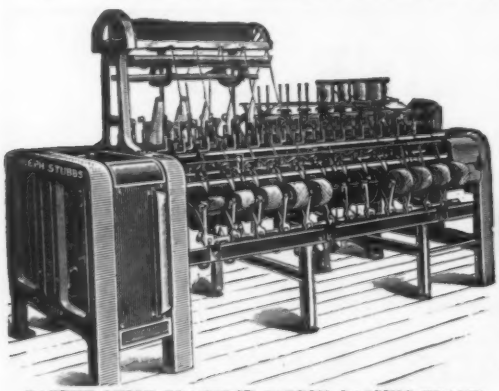
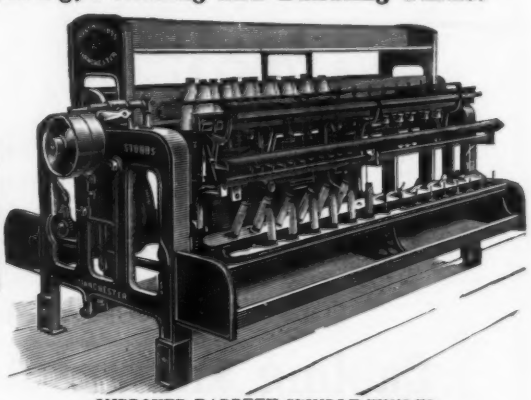
For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



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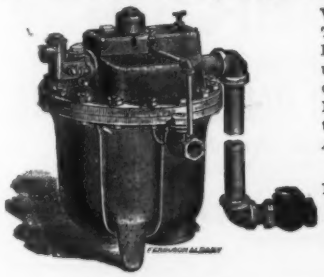

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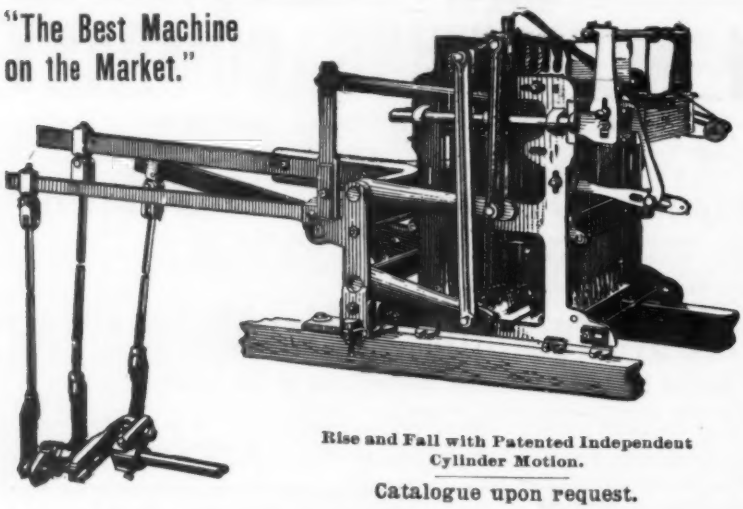

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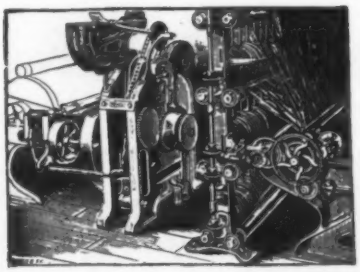

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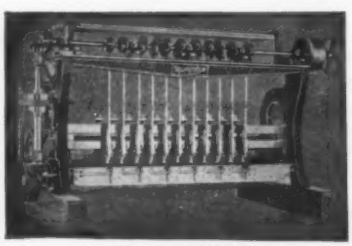

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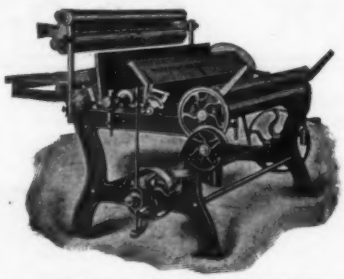

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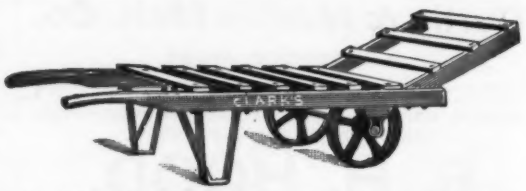

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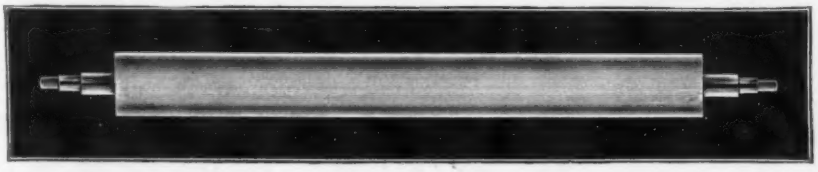

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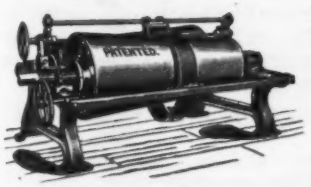

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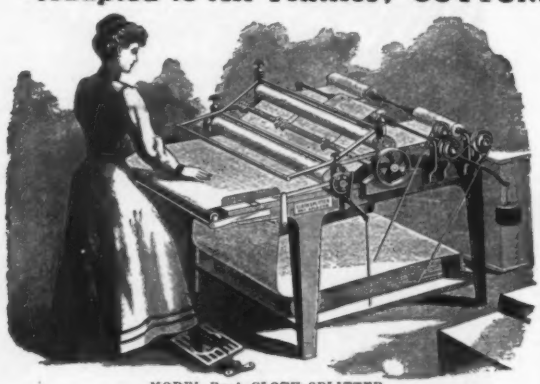

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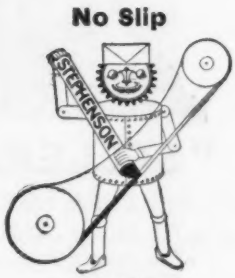

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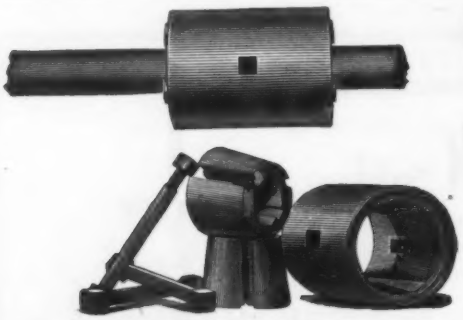

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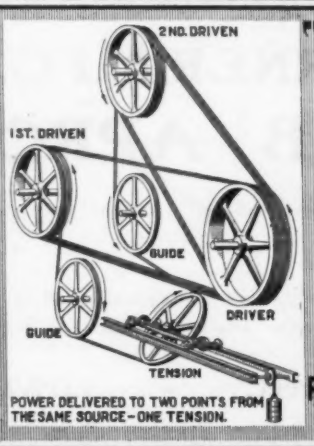

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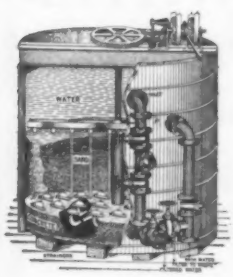

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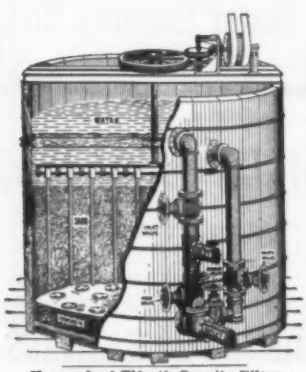

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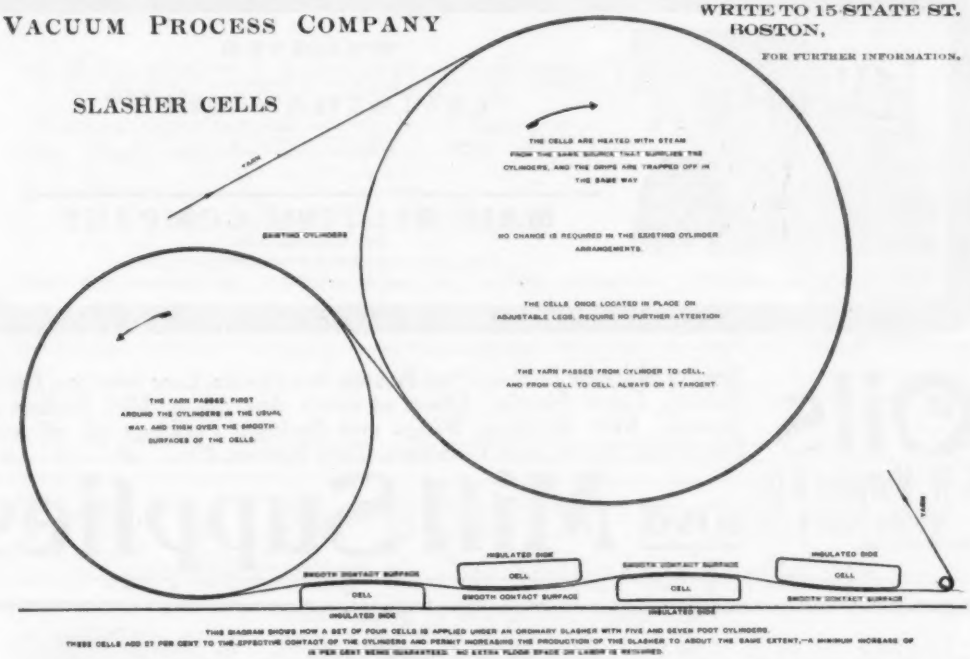
SLASHER CELLS


YARN
EXISTING CYLINDERS
THE CELLS ARE HEATED WITH STEAM FROM THE SAME SOURCE THAT SUPPLIES THE CYLINDERS, AND THE DRIPS ARE TRAPPED OFF IN THE SAME WAY
NO CHANGE IS REQUIRED IN THE EXISTING CYLINDER ARRANGEMENTS.
THE CELLS ONCE LOCATED IN PLACE ON ADJUSTABLE LEGS, REQUIRE NO FURTHER ATTENTION
THE YARN PASSES FROM CYLINDER TO CELL, AND FROM CELL TO CELL ALWAYS ON A TANGENT
THE YARN PASSES FIRST AROUND THE CYLINDERS IN THE USUAL WAY, AND THEN OVER THE SMOOTH SURFACES OF THE CELLS.
INSULATED SIDE
SMOOTH CONTACT SURFACE
CELL
SMOOTH CONTACT SURFACE
INSULATED SIDE
CELL
INSULATED SIDE
SMOOTH CONTACT SURFACE
CELL
INSULATED SIDE
SMOOTH CONTACT SURFACE
YARN

THIS DIAGRAM SHOWS HOW A SET OF FOUR CELLS IS APPLIED UNDER AN ORDINARY SLASHER WITH FIVE AND SEVEN FOOT CYLINDERS.
THESE CELLS ADD 37 PER CENT TO THE EFFECTIVE CONTACT OF THE CYLINDERS AND PERMIT INCREASING THE PRODUCTION OF THE SLASHER TO ABOUT THE SAME EXTENT,—A MINIMUM INCREASE OF 15 PER CENT BEING GUARANTEED. NO EXTRA FLOOR SPACE OR LABOR IS REQUIRED.

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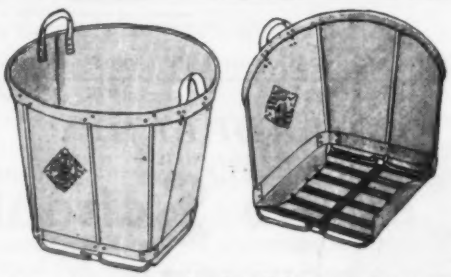

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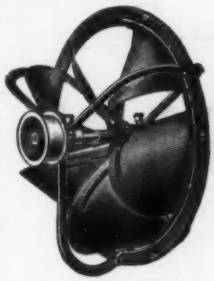

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Patent Applied for.

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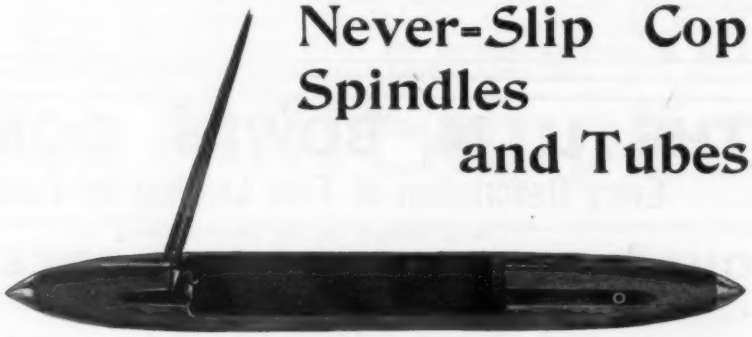
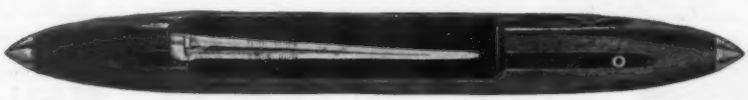


Shuttle with Spindle Raised

U. S. Patents; 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending



Shuttle with Spindle Lowered.

U. S. Patents: 778851, Jan. 3, 1905; 79611, May 23, 1905; other patents pending

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We can guarantee that with our combination of Never-Slip Cop Spindles and Tubes, looms can be run with longer cops than used at present, at a much faster rate of speed.

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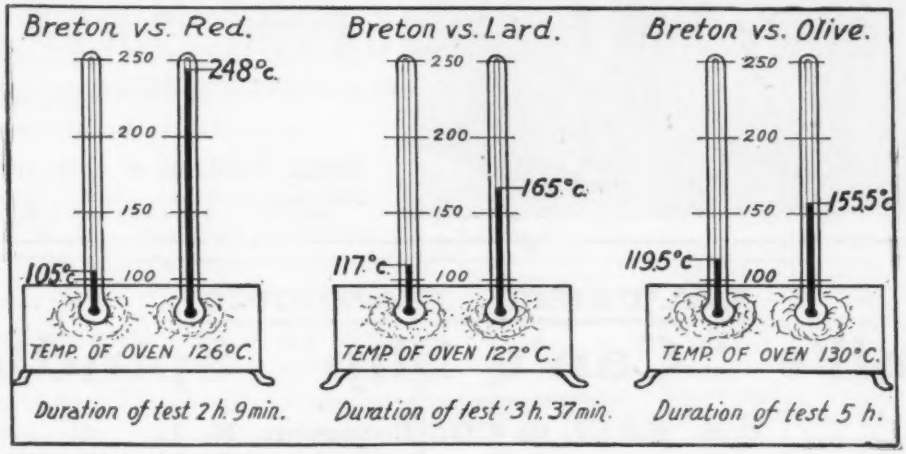

Please note all temperatures are centigrade.

The above cut shows graphically results of test by Prof. Ordway of Mass. Inst. Technology to determine the safest product to be used in oiling wool stock in relation to spontaneous combustion. Cotton waste soaked with BRETON against Olive, Lard and Red Oil, as indicated, heated in ovens for specified intervals, with resultant temperatures, due entirely to oxidation, as shown.

Complete copy of above test, mailed on request.

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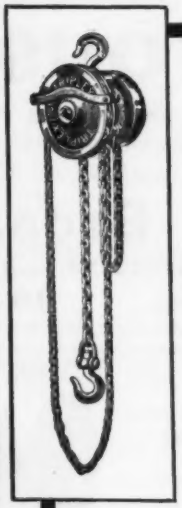

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Acknowledged to be the highest in efficiency of any pumps built—that is they deliver more water with less expenditure of power than pumps of any other design and they are therefore known as

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And are the standard of excellence everywhere.

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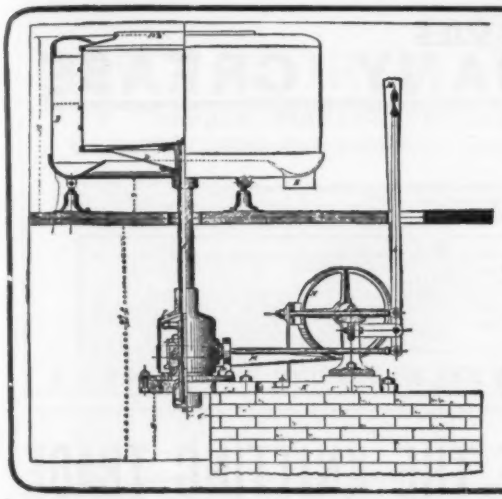

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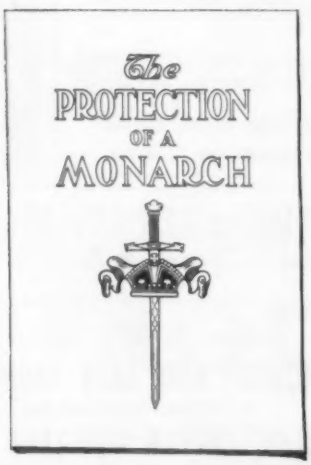

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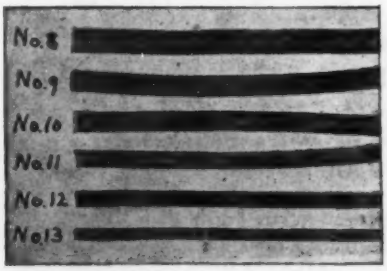

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IF SOME OTHER mill, manufacturing the same line as yours, should improve the quality of their goods and effect great economy in manufacture by installing electrical warp stop-motions on their looms, and if this should come to your knowledge, wouldn't you sit up and take notice?

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¶We can demonstrate the practical worth of this motion most anywhere. In your own mill, if you choose, without expense to you.

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Furnishes the Electrical Apparatus for driving and lighting all classes of

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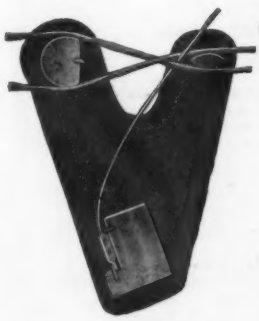
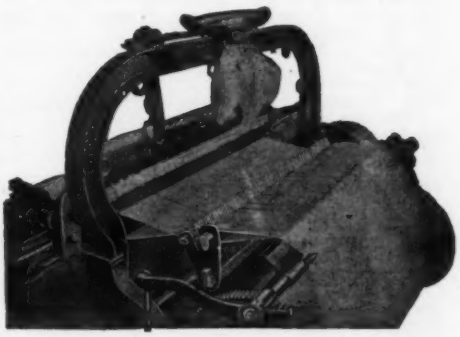
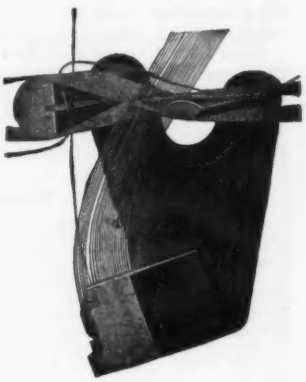


Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is
UNDER CONTROL,
and
ABRASION of the
yarn is AVOIDED.



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT** of the **WARP,** so that **the COVER** of the cloth is **UNAFFECTED.**

When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place
of the BROKEN END,
and, by striking
a CONTACT SLIP upon which
LINT CANNOT COLLECT,
closes the circuit through
a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**



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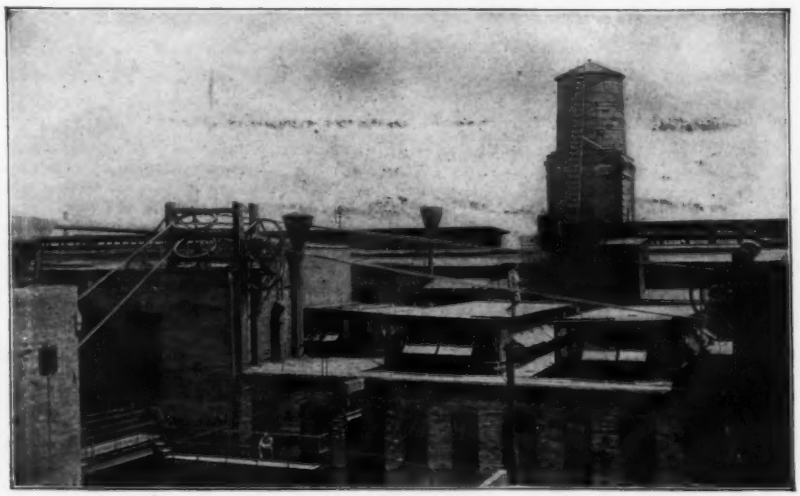

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PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers' names. A list of city offices of textile mills is given.

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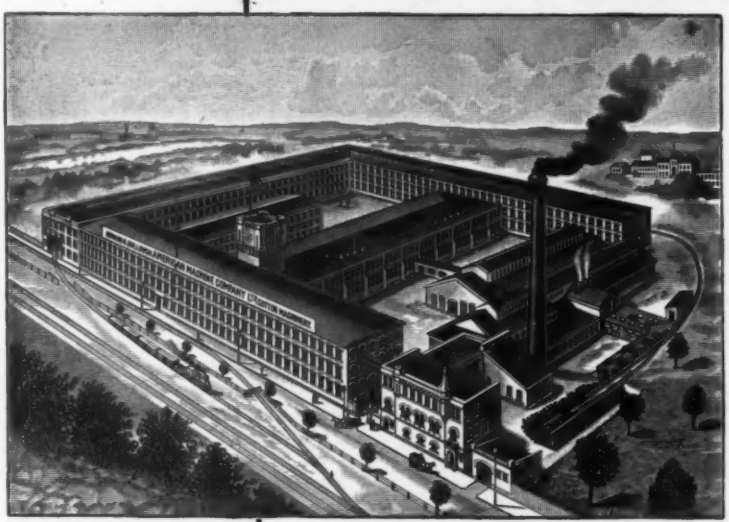

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The Textile World and Textile Record.

VOL. 31. (NEW SERIES.) JULY, 1906 No. 4

Monthly Comment.

How the Sliding Scale Slid.

In the recent general advance of wages in New England cotton mills the Fall River sliding scale has been abandoned. Beginning with July 2, 1906, wages in the mills of that city were advanced 10 per cent. from the present fixed basis of 18 cents a cut, to 19.8 cents, the rate prevailing before the cut of 12 1/2 per cent. in 1904. Following the advance in Fall River came corresponding increases in the mills of Rhode Island, Connecticut and other parts of New England. The rates of increase were apparently satisfactory everywhere except in New Bedford, where the operatives demanded 10 per cent. The employers finally offered 5 per cent., and this was accepted under protest by the weavers who insist on the adoption of a standard list similar to those in force in Lancashire. A vote by the weavers on the question resulted in a majority in favor of striking. As the rules of the union require a two-thirds vote before a strike is declared, the weavers continued at work.

The following table shows the operation of the Fall River sliding scale for the thirty-six weeks from its adoption in October to its abandonment on June 30, 1906:

Week ending	Middling Uplands	28-inch 64×64	38½-inch 64×64	Margin	Wage premium above 18c per cut $
1905					
Oct. 27	10⅛	3¾c	4¾c.	.77	5
Nov. 3	10.8583	3⅝c	4.8958c	.757	3
10	11.61	3⅝c	5c	.714	0
17	11.28⅛	3⅝c	5c	.74	2
24	11.43⅛	3⅝c	5.041c	.735	1
Dec. 1	11.80	3⅝c	5.15c	.752	3
8	12.35⅝	3¾c	5⅛c	.724	0
15	12 03⅛	3¾c	5⅛c	.7502	3
22	12.19⅛	3¾c	5⅛c	.7376	1
29	11.99	3¾c	5⅛c	.7537	3
1906					
Jan. 5	11.86	3¾c	5⅛c	.7641	4
12	11.76⅞	3.79166c	5⅛c	.7809	6
19	12.125	3.79166c	5⅛c	.7523	3
26	11.96⅞	3¾c	5⅛c	.7556	3
Feb. 2	11.475	3¾c	5⅛c	.7949	7
9	11.26⅜	3¾c	5⅛c	.8116	9
16	11.23	3¾c	5⅛c	.8145	9
23	10.99	3¾c	5.2125c	.8275	10
Mar. 3	10.92⅛	3¾c	5 3/16c	.8285	10
10	11.25⅜	3¾c	5 3/16c	.8019	8
17	11.05⅝	3¾c	5 3/16c	.8127	9
24	11.42⅛	3¾c	5⅛c	.7782	5
31	11.72⅛	3¾c	5⅛c	.7542	3
Apr. 7	11.63⅛	3⅝c	5⅛c	.76152	4
14	11.76⅜	3¾c	5⅛c	.75016	3
21	11.80	3¾c	5⅛c	.74819	2
28	11.70⅝	3¾c	5⅛c	.75552	3
May 5	11.75	3⅝c	5⅛c	.7285	0
12	11.75	3⅝c	5⅛c	.714	0
19	11.96⅜	3⅝c	5⅛c	.7068	0
26	11.90⅝	3⅝c	5⅛c	.7114	0
June 2	11.64	3⅝c	5⅛c	.7163	0
9	11.23⅛	3⅝c	5c	.7447	2
16	11.21⅜	3⅝c	5c	.7460	2
23	11.00	3⅝c	4⅞c	.7146	0
30	10.81⅜	3.4375c	4⅞	.7152	0
Average for 36 weeks					3 41/100 %

The reasons for the failure of the sliding scale at Fall River are well known and, as they have been repeatedly stated in our columns, need not be repeated now. Although it has failed to meet the expectations of both employers and operatives, yet the test that has been made of it has by no means been devoid of good results. The experiment has shown that the difference between the market price of raw material and that of finished goods is not a sound basis for regulating the rise and fall of wages. It is well to have questions like this put to the final test of experiment, so that the air may be cleared for the future.

The Bremen Cotton Congress.

The cotton congress at Bremen on June 25, 26 and 27 was the third meeting of this kind to be held by the International Federation of Cotton Spinners' and Manufacturers' Associations. The official delegates from the American Cotton Manufacturers' Association were Charles H. Fish, of Dover, N. H., and D. A. Tompkins, of Charlotte, N. C. Cable reports state that several other Americans were present, including J. R. MacColl, president of the National Cotton Manufacturers' Association, and Charles J. Plunkett.

Previous to the Congress the International Committee met at Berlin, and were received by various high officials of the German government. Only the most meagre reports of the Bremen Congress have been given to the press. The by-laws of the Federation provide that the proceedings shall be secret. This rule has been rigorously enforced and has evoked much criticism, the argument in favor of publicity being presented by the Textile Mercury is as follows:

THE INTERNATIONAL COTTON CONGRESS AND THE PRESS.

The third International Congress of Master Cotton Spinners and Manufacturers Associations takes place at Bremen (Germany) on the 25th, 26th, and 27th inst. On the Friday and Saturday prior to the commencement of business on the Monday, the delegates will assemble in Berlin, where they will have opportunities of conversing with the heads of the Government. The United States is again to be represented at the Congress; and this year (for the first time) delegates are expected to be there from Japan, the latest competitor in the textile markets. We presume that the same secrecy with regard to the proceedings will be observed as on former occasions. Why the Congress should be conducted within closed doors, and "cut-and-dried" reports—very much cut and dried—be doled out each day to the Press, was very much discussed when the international gathering took place in Manchester last summer. No one, however, could give a satisfactory explanation; but somehow or other Congress officials appear to be under the impression that it is the rule of industrial conference to keep the public in the dark with regard to their opinions on vital questions concerning industrial welfare. We beg to remind them that it is not so. There would likely be more good than harm don in endeavoring to stimulate public interest in proceedings so important as those of an international assembly representing one of the world's leading industries.

Last year an English reporter applied for a ticket of admission to the Congress, and, on being informed that reporters were not admitted, he was sure some mistake must have been made. He presented himself at the place of meeting. The door being locked against him, he insisted upon seeing one of the officials. One appeared, and the reporter was further amazed with the expression (from the officials)—"Good heavens! man, did you ever know, in any part of the world, of a congress of this kind being open to the Press?" Last year, however, there was a "chiel amang 'em" taking notes: The American delegate (Mr. Dale) was a journalist, and he turned his experience to journalistic purposes! The result was encouraging; for, apart from his unfavorable criticisms, he published much information that must have been welcomed by thousands of persons interested in the cotton industry and in the spirit of internationalism.

The International Federation is young, being but a two-year-old, and as time passes those in control of its methods will doubtless learn that much harm results from this profound secrecy regarding the state of the cotton trade. The ludicrous extreme to which this policy has been carried was illustrated at the Liverpool meeting last year where the Lord Mayor and the ladies accompanying the delegates were compelled to retire from the room before the Congress began the discussion of the metric system! This policy of secrecy has already failed completely in the case of the statistics of cotton at the mills that the Federation has been compiling. These were to be disclosed only to members, but each of the two reports so far issued has appeared in the European press before it had reached all of the members. Anything of great importance to the world's cotton trade cannot be kept secret and attempts to keep minor matters secret result only in creating an unwarranted distrust of the objects of the organization. Great benefits to the cotton

trade can be brought about by international co-operation on the right lines. In respect to publicity the International Federation can adopt with profit the wide open methods of the recent International Conference of Cotton Growers and Manufacturers at Washington.

The Australian Wool Market.

A lack of moisture makes a large part of Australia a desert, while the irregularity in the rainfall subjects the more favored parts of that island continent to great vicissitudes in production. Prosperity in Australia is, consequently, a question of rainfall, first, last and all the time. This year the country has been favored with heavy rains at the right time and as a result the sheep raising industry is thriving. The flocks are increasing rapidly and the prospects are excellent for a large increase in the yield next season. Goldsbrough, Mort & Co., Melbourne, report that sales of wool in Australian markets the last year amounted to 1,100,000 bales, or 82 per cent. of the entire clip, which was estimated at 1,400,000 bales. The increasing demand for wool more than offsets the influences that tend to lower prices, such as the increase in the supply and the falling off in the Japanese demand. The governments of Victoria and New South Wales have purchased large tracts heretofore devoted to sheep raising and are parceling the land among smaller holders. This will result in the disappearance from the market of a number of well-known clips, and the substitution of mixed wools raised by smaller land owners.

The 1905 clip, it is stated, was extremely tender, although the fleeces were very attractive to the sight. This condition is attributed to the heavy rains in April, May and June, which caused a super-abundance of green feed. The condition was lighter than the average, but this was offset by the tenderness of the staple, bringing the yield of "top" rather below the average.

Rabbits are reported to be on the increase and to have invaded districts previously free from them. Goldsbrough, Mort & Co. report that the systematic, continuous and very expensive measures have not been more than an obstacle to the progress of the rabbit pest. Forty years ago two or three pairs of rabbits were turned loose in Victoria. Their descendants now number untold millions and threaten the existence of agriculture in Australia. Several years ago Pasteur offered to put an end to the pest by introducing an infectious disease among them. This proposition found few supporters for a long time because of the fear that the disease intended to exterminate the rabbits would spread to the sheep, cattle and other domestic animals. Recently, however, the Australian government has been induced to try the Pasteur plan. A large island off the coast of New South Wales has been selected for the experiment. Cattle, sheep, poultry and other animals have been placed on the island with the rabbits, to test whether the disease will be confined to the latter or not. It is stated that this method has been used successfully to rid Southern France and Northern Italy of mice, and the city of Marseilles of rats and without the spread of the disease to other animals or to human beings.

Immigrants and the South.

The efforts so far made to get the immigrants to this country to settle in the United States have not been followed by any considerable degree of success. Of the 120,951 arrivals at Ellis Island in May, 96,786 or 80 per cent. were distributed as follows:

40 per cent to New York.
16 per cent. to Pennsylvania.
8 per cent. to Illinois.
7 per cent. to New Jersey.
5 per cent. to Massachusetts.
4 per cent. to Connecticut.

Only 578 of these immigrants, or less than 1/2 per cent. of the total, were bound for the South. Various reasons are given for this avoidance of the South, such as the higher wages in the North and the fact that the newcomers prefer to settle where they have friends or can find companions of their own race and language. The rate at which immigrants are now arriving has never before been exceeded. It is estimated that the number landing at New York alone will reach 1,000,000 for the year ending June 30.

A Textile School Proposed at Toronto.

Steps are being taken to establish a textile department in connection with the Toronto Technical School, which is to be greatly enlarged and to have the scope of its work extended. It is proposed to have the textile department include both cotton and woolen manufacturing. This educational enterprise is in keeping with the industrial activity now prevailing throughout Canada. That country is in the early stages of a development which is likely to exceed the highest estimates made today. The Canadian manufacturers realize fully the importance of technical training. The broadening of the scope of the Toronto Technical School is in line with the general policy to place facilities for obtaining technical instruction within easy reach of the young men and women of Canada, and make the country independent of foreign schools as far as possible. We are informed by a prominent Toronto manufacturer that it is proposed to have the equipment of the textile department thoroughly up to date. Already offers of machinery and appliances have been received from both domestic and foreign builders, who appreciate the advantage it will be to them to have their machines used in the Toronto school.

A Word of Caution.

Optimism prevails in the cotton trade of Europe. Cotton may be high, but goods are selling freely at prices in proportion, and new mills are being started on an unprecedented scale. A Manchester merchant has recently sounded a note of warning against this expansion and called attention to some facts that indicate that a reaction may be near.

The present prosperity started in the early part of 1904 immediately after the short time of 1903 and during the period of cheap cotton resulting from the 14,000,000 bale crop. A scarcity of goods and a plentiful supply of cheap cotton supplied the conditions for a boom that 12-cent cotton has not been able to check. The increase in the demand has come principally from the Far East. England exported 435,000,000 yards more in 1904 than in 1903, and of this increase 73 per cent. went to the East. The year 1905 showed an increase of 606,000,000 yards over 1904, of which 90 per cent. went East. The danger of an early reaction from this high tide of foreign trade arises from the fact that the storehouses of the East are glutted with goods. These large stocks are being rapidly increased by receipts on contract, which are largely in excess of the demand from the consumer.

Another important factor in the situation is the high cost of the goods now being delivered and which increases the risks under which business is now being carried on. For the thirteen years ending 1903 the English exports of cotton cloths average 5,103,000,000 yards, valued at $246,888,000 per year, while the annual average for 1904 and 1905 was 5,895,000,000 yards, valued at $327,564,000, an increase of 15 1/2 per cent. in yardage, and 32 1/2 per cent. in value. For the thirteen-year period the average value per yard was $.0483, as compared with $.0556 per yard for 1904 and 1905. The English merchant concludes with the remark that "judging by all precedents such figures foretell a reaction sooner or later, which will be lasting and may be severe."

Low Wages in Europe.

From time to time the disputes between employers and employes in European mills disclose the low wages and hard conditions of employment prevailing there, and serve as warnings to Americans against any reduction of the tariff that would bring our working people in competition with cheap foreign labor. The latest instance is the demands made by the dyers in M. Gladbach and Odenkirchen, Germany, for a 10-hour work day and an increase of 20 per cent. in wages, with a minumum wage of 22 marks ($5.28) per week for skilled hands. From this it would appear that the present rate is around $4.40 per week.

The operatives also ask for 12 cents an hour for overtime week days, and 24 cents an hour on Sunday; that the apprentices receive $1.92 a week for first year, $2.64 for second year and $3.36 for the third year; and that the number of apprentices be limited to one for every ten operatives.

Cotton and the German Tariff.

When the German tariff went into effect last March with its maximum and minimum rates the German government conceded the minimum rate to the United States without receiving any concessions from this country. The arrangement was nominally for one year and was made in response to the appeals of German merchants and manufacturers. They feared disastrous results from a tariff war between the two countries, as we can buy from other countries all that we now get from Germany, while Germany can get nowhere else the bulk of the products now bought in America.

This condition results chiefly from the American monopoly in cotton growing. For the ten months ending April of this year our exports of raw cotton direct to Germany were valued at $89,941,714. This is at the rate of $112,427,142 a year or $37,475 per working day. The tariff relations between the two countries thus turn on the question of cotton. If Germany can get cotton outside of the United States, more especially from German colonies, the favors now granted to us without consideration will be withdrawn and the minimum rates will be collected on American goods imported only in return for corresponding reductions in the Dingley rates on German goods brought into the United States. How near, or rather how far the Germans are from this independence is shown in the following extract from the recent report on cotton growing in the German colonies, by the chairman of the German Colonial Committee:

> The existing temporary trade arrangement with America has again brought into prominence the importance of independence in that country, particularly in respect to the production of the raw material. Among these cotton is the most important. The German textile industry, along with the allied industries, gives employment to about one million workers, the annual product being valued at $250,000,000, for which raw material valued at $112,000,000 is required annually, the greater part of it coming from America, which with England is our leading competitor in the manufacture of cotton goods. It is estimated that during the current year the world's requirements in respect to cotton will exceed the supply by one million bales. To make the situation worse the Egyptian crop shows a decrease and the hopes built on the dam at Assoun have not been realized. This dam has held back the sediment of the Nile and thus temporarily at least resulted in a deterioration of the quality and a decrease in the quantity of Egyptian cotton. The different countries of Europe with colonies suitable for cotton culture have encouraged various colonial cotton growing associations. The German company has been especially favored by government support, and by the exchange of processes and seed has worked in harmony with the associations in other countries. Cotton growing at Togo, which up to the present time has been confined to individual cultivators, has suffered during the year 1905 by reason of the drought. The so-called rainy season has failed completely. Nevertheless the crop was larger than during the previous year and amounted to 257,500 pounds, valued at $37,500. Recent reports state that there has been a good rainfall and the prospects for the future are bright. The quality is greatly improved; the product of the cotton school at Nautscha sold for two cents per pound more than middling American. The improvement in the quality is shown by the sale of Togo cotton from several districts at three-quarters of a cent above middling American. Ginning stations have been established near the leading markets. In order to assure to the natives a market for their cotton the Wirkschaftlisches Komitee have guaranteed a minimum price of 7 1/4 cents per pound for cotton at Lome till July, 1907. In order to increase the cotton crop it is necessary to teach the natives to use the plow instead of the hoe for tilling the ground. The possibility of doing this has been proved by experiments at the school of Nautscha and at the experiment stations of Sokode and Kpeme. Experiment for several years has shown that the natives when instructed by European experts learn to use the plow and also to break in oxen. The cattle in the interior of Togo, although small, have been found well adapted for plowing. Because of the progress made by the natives in handling the plow, plowing has been made a regular course at the school at Nautscha. When the students leave the cotton school each is supplied with a plow and an ox and the necessary farming implements. Favorable conditions for cultivating the land with the plow exist in the northern districts because of the absence of disease among the cattle.
>
> As a matter of course the time required for the development of the cotton growing in such conditions must be measured by decades and success will necessitate large expenditures of money. The extension of the railroad from Lome to Sokode has been followed by a marked increase in cotton growing along the line. In the Sokode district the natural conditions are favorable to cotton cultivation, but the cost of transporting it from the coast is prohibitive, amounting to five cents per pound.

The cotton mills of Germany are using $37,500 worth of American cotton a day. As a result of subsidizing railroads, ginneries and cotton schools, the free distribution of cattle and farming tools and by guaranteeing a mimimum price to the natives, Togo is producing $37,500 worth of cotton a year, or enough every twelve months to displace one day's supply of American cotton. The actual

cost of Togo cotton grown under present conditions is not known. Probably by any reasonable system of bookkeeping it would be nearer one dollar than twelve cents a pound. While Germany and other European countries are wasting their resources in such discouraging experiments vast tracts of land unrivaled for raising cotton lie idle in America from lack of farm laborers, and the world's requirements for cotton continue to increase at the rate of 400,000 bales a year. How long will the sensible Germans continue to neglect the opportunities in the Southern states and waste their energies in Togo? How long do they think it will be before Togo cotton makes their mills independent of the United States?

Germany now has a small tariff war with Canada on her hands, and the results so far are not calculated to encourage her to engage in a similar contest with the United States. As a result of placing the maximum tariff rates on Canadian goods imported into Germany, Canada retaliated by raising the tariff on imports from Germany. In the fiscal year 1902-3, before this change was made, Germany exported $12,130,000 worth of goods to Canada; in 1904-5 this trade has amounted to but $6,640,000, a decrease of nearly 50 per cent. Large as this loss is, it is small compared with the shrinkage of German trade that would follow a tariff war with the United States.

Wool Imports.

Although the imports of wool for the ten months ending April show a considerable decrease from the corresponding period of the preceding year the total still remains much above that of 1904. The figures for the three 10-month periods are as follows:

1906, 172,532,247 lbs. $33,425,262 at 19¼c.
1905, 198,629,221 lbs. 36,120,369 at 18½c.
1904, 139,916,690 lbs. 19,661,609 at 14c.

The average value of each class of wool shows for 1905 and 1906 an increase over the preceding year, but the general increase from 14 to 19.4 cents per pound is due to the decrease in the proportion of class 3 wool from 70 per cent. in 1904 to 48 per cent. in 1905 and 49 per cent. in 1906.

Better in Texas than in Togo.

It is gratifying to note that the leading cotton manufacturers of England are publicly recognizing that the United States is the best, in fact the only country from which to obtain an adequate supply of cotton for mankind. This fact has been recognized for many years. It was proved beyond reasonable doubt by the cotton famine during our civil war. The vast majority of those engaged in the growing of cotton, and the manufacture and sale of cotton goods, who do all the work and very little talking in the cotton world, have accepted it as a demonstrated truth. Hence the difficulty of obtaining subscriptions among English manufacturers to support the cotton growing associations, and the contempt with which the whole colonial cotton scheme is treated among the cotton traders of Liverpool.

A new generation has come on the scene since 1861-5. But a comparatively few manufacturers of that period still remain in business. Because of this the alluring idea that the cotton trade of Europe could become independent of America has found many supporters, numerous, prominent and noisy enough to create an artificial sentiment in favor of promoting cotton growing in the colonies. The skeptical majority have remained silent while the colonial enthusiasts appealed for public and private funds, sent delegations to the government at London, gave banquets and passed resolutions. Recently, however, a change has taken place. The believers in the principle that cotton should be raised first where it can be raised at the lowest cost and in the largest quantity have become more outspoken. The altered condition is illustrated by a recent statement of C. W. Macara, a leading English manufacturer and president of the International Cotton Federation of Europe. At a hearing before the British prime minister, J. A. Hutton, chairman of the British Cotton Growing Association, said that the only way to relieve the situation is to "smother the speculator with British cotton," and then appealed to the prime minister for a government railroad in Northern Nigeria by which to bring to the coast the cotton with which the smothering is to be done. To this Mr.

Macara replied, in an interview which is thus reported:

Mr. Macara said that while he did not underestimate the importance of cultivation of cotton in the colonies, he regarded it as absurd for statesmen to talk of smothering speculators with British cotton.

Many years, Macara said, must elapse before any substantial supply can be obtained from British sources. Much is possible by the development of the industry in India; but for the present Great Britain is mainly dependent on the southern states of America, where there are yet immense possibilities.

The British commission, which has just returned from the southern states, has not yet reported, but Macara said he believed its report would be a unanimous declaration that there is virtually an illimitable field for the extension of cotton cultivation in the United States, the chief difficulty being to get the requisite kind of labor.

Macara thinks the growing of cotton at ten cents a pound ought to be remunerative enough to attract capital, and that if labor and capital were obtainable there is little doubt that the United States might add millions of bales to her present output. "It will be our duty," Macara said, "while encouraging the British cotton growing movement also to do what we can to further the systematic extension of cotton cultivation in the southern states, where I am convinced our chief hope of an adequate supply of the raw material at present lies."

This is a somewhat tardy admission of facts that have long been known and repeatedly demonstrated. On June 6, 1905, the American delegate to the International Cotton Congress, of which Mr. Macara was president, stated in the following words the truths that Mr. Macara now admits:

Nothing is easier than to predict the limit of the American cotton crop, unless it is in being wrong in such prediction. A year ago it was predicted that America had reached her limit of cotton production, but the Southern planter took off his coat, rolled up his sleeves and gave the world more cotton last season than was grown in the whole world seven years ago. Instead of prophesying I want to call your attention to some facts. The cotton belt of the South has an area of 650,000 square miles, almost as large as France, Germany and Austria-Hungary combined, and yet the area under cultivation is but one-third the size of Prussia.

So far as is known, nature has created no better conditions for raising cotton than in the Southern States. There are vast tracts of rich land, the required amount of rainfall to water the ground, the proper amount of moisture in the air, and sunshine to give the light and heat required in the growing season. There may be a limit to the cotton raising possibilities of the South, but it is not yet in sight. All that is necessary is strong arms and willing hands to plant the seed and gather the crop.

To the spinners of Europe it makes no difference where their cotton is grown, as long as they get enough of it. As well in Texas as in Togo; in Mississippi as in Madagascar; in Louisiana as in Lagos. This thought of danger in a cotton supply from America, simply because it is from America, is an economic fallacy. It may surprise you to know that Lancashire is nearer to Texas than is Massachusetts. Just before I left Boston the freight on cotton from Texas ports to Manchester was 95 cents a hundred, and to New England $1.00 to $1.10 a hundred. Any material change in these conditions is made practically impossible by the greatest free trade document in existence, the Constitution of the United States, which forbids duties on exports.

Labor is scarce in the South, but plentiful in Europe. The population of the entire cotton belt is but 15,000,000 less than that of Switzerland, Holland and Belgium. The great need of the South is more people. A million emigrants a year are leaving Europe for the United States, and yet not five thousand of them reach the South where labor is needed to supply Europe with cotton. They crowd into the already overcrowded cities of the North, when they might become prosperous and independent planters in the South. The bare statement of this condition points to the solution of the cotton problem. When the cotton spindles do not supply the looms you build more spinning mills. When the cotton fields do not supply the spindles the remedy lies in sending your surplus labor into the fields to raise cotton.

Now that the European manufacturers recognize how and where to get cotton for their mills, the problem for them to consider is how to increase the labor supply in our Southern States.

A Brokerage Combine.

Several weeks ago an incident in the jute trade of Calcutta illustrated the strong position held by the jute brokerage firms and the uselessness of trying to carry on the jute manufacturing business without them. One of the leading dealers in jute made the experiment of selling direct to the mills, with the idea that the 1 per cent. commission for brokerage could be saved and divided between the mill and the seller. Hearing of this practice eight of the leading jute brokers in Calcutta sent a circular to all the mill agencies protesting against direct dealing between the mills and jute merchants, and threatening to boycott the manufacturers if their demand was not conceded. The result was that the firm that had begun the experiment abandoned it at once and the former custom of buying only through brokers was restored. The brokers claim that while they intend to oppose vigorously any attempt to

put them out of business, the continuance of the present brokerage system is to the advantage of both the manufacturer and dealer, and that the 1 per cent. paid to the broker is for services that are worth far more than that amount.

This view of the case is supported by the evidence of jute manufacturers that have tried to buy direct. In Dundee the business is done through brokers, as at Calcutta, and the experience of the Dundee jute manufacturers in trying to eliminate the brokers are thus stated by one of them:

> One by one, after giving the thing a good trial extending over years, they gave it up. They found the cheapest market for jute (as it is today) is in front of their own Royal Exchange, where competing brokers bring to them offers of the stuff they want at the lowest possible market price. One of the notions they had in having their own buying agencies was that unless they adopted this plan they could not get the "quality" they required. This fad has long been exploded (although some mills here are still possessed by the notion). Brokers can supply any "quality" and just give the quantity required. Some junior partners of a Dundee firm, when visiting Calcutta, thought it would be a good thing to purchase a lot of jute here at first hand and send it home, thus saving a lot of intermediate profits and commissions. Speaking feelingly a year or two after, their senior said, "That trip cost our firm £10,000. We could have bought the jute so much cheaper in Dundee."

Labor in Southern Mills.

It is plain that the South no longer possesses the large unemployed population that has heretofore supplied Southern mills with help willing to work long hours at low wages, and that made possible the phenomenal development of cotton manufacturing in that section. The demand for labor in the South has overtaken the supply. There are more jobs than there are hands willing to work, and as a result working time is being shortened and wages are being brought nearer to the Northern level. The latest indication of this change is found in resolutions adopted at Greenville, S. C., by about seventy South Carolina cotton manufacturers, representing 2,500,000 spindles. They were to the effect that on July 1 the working time shall be reduced to 64 hours per week; on July 1, 1908, a further reduction to 62 hours is to be made, and after July 1, 1910, the working time is to be 60 hours per week. The manufacturers at this meeting resolved to obey the State law forbidding the employment of children under 12 years of age.

The importance of these resolutions can be easily overestimated. With no penalties for violation the manufacturers are left free to run their mills as many hours as the law allows. Moreover the postponement of the 60-hour schedule for four years deprives the resolutions of much of their value. Many things may happen in four years. With spindles and looms idle now for want of help a promise of a 60-hour working week some time in 1910 is not likely to bring the labor supply that is needed at once. The Greenville meeting is worthy of note, however, as indicating the trend toward shorter hours in Southern mills and the disappearance of those factors that have given the Southern mills a certain advantage over their Northern competitors in the cost of production. Such differences could not long endure within the same tariff enclosure.

Specializing Textile Schools.

The discussion of technical instruction in textile manufacturing has recently been revived in England by a report of C. Armitage, head of the textile department of the Huddersfield Technical College. Mr. Armitage recently visited the United States and made a study of American technical schools on the spot. His report, which followed this visit, is strongly in favor of specializing the work of English textile schools, confining each school to one branch of the industry. While it is not stated whether this conclusion was the result of his observations in this country, it is a fair inference that he saw nothing here to lead him to an opposite opinion. He recommends that the work of British textile schools be specialized as follows:

Manchester: Cotton.
Leeds: Wool and mixed goods.
Bradford: Dress goods.
Huddersfield: Worsteds, vestings and trouserings.
Halifax: Carpets.
Belfast: Linen.
Dundee: Jute.

This division is based on the principle that the specialized school should be located in

the centre of that branch of industry to which the school is devoted. The advantages of such location are obvious. It places the instruction that the greatest number need within reach of the greatest number. This is of benefit to day as well as night students, but especially to the latter. It gives the school the advantage of quick and easy consultation with manufacturers and operatives engaged in the same branch of manufacturing; in this way the instruction will be made more practical and the natural tendency toward theory in the class room will be counteracted. It enables each school to be supervised by practical manufacturers in the branch to which it is devoted.

Mr. Armitage believes it is a waste of money and results in a loss of efficiency to establish large schools, each attempting to cover the whole textile field. In connection with this point the Textile Mercury calls attention to the fact that the cotton students educated at the expense of the Lancashire County Council failed to give satisfaction to the cotton spinners and manufacturers because they lacked special knowledge of the cotton industry. Mr. Armitage's report is of special interest in this country because it has been written after a study of American schools, and the suggestions he makes deserve careful consideration by our textile educators.

Ran Against the Textile Snag.

It is estimated that one-quarter of the inhabitants of Great Britain and Ireland depend directly or indirectly on textile manufacturing for support. This will aid in estimating the significance of the following letter addressed to members of Parliament in the Manchester and Salford district by the Manchester Chamber of Commerce:

"May 26th, 1906.

"Dear Sir:—I am desired by the Board of Directors of this Chamber to inform you that, at the last monthly meeting, they unanimously adopted a resolution with regard to the compulsory use of the Metric System in this country—which is intended to embody their policy henceforth with regard to this proposed legislation.

"This resolution is to the following effect:—'That, whilst continuing to support the enforced adoption of the Metric System of weights and measures for general purposes in this country, the Chamber shall always maintain—in any future action taken in support of legislation to bring this about—that the Cotton Yarn Trade and the Engineering Trades ought to be expressly exempt from such legislation, either by a clause in the Act, or by the terms of an Order in Council, power to issue such orders being provided in the Act.'

"The Members of Parliament are, it is understood, being pressed to promise support to a compulsory Metric Weights and Measures Bill. I am, therefore, directed to bring the views of the Directors of this Chamber before you, and at the same time to express their belief that any legislation which fails to recognize these exceptions would be met by strenuous opposition from the great industries referred to in the second paragraph of this communication.

"I am, etc.,
Walter Speakman,
"Secretary."

Growth of German Mills.

A recent census of German cotton mills has enabled the Leipziger Monatschrift to make the following comparison between the number of spindles in operation in 1893 and at the present time:

1893	5,328,457
1905	8,684,000
increase	3,355,544

The average wages in the German cotton industry are, according to official statistics, as follows:

North Germany $191.04 per year.
South Germany 162.72 per year.

Advance of Wages in Lancashire.

According to an estimate made by a leading English cotton manufacturer, the cotton mill operatives of Lancashire are now receiving annually $8,262,000 more in wages than in 1900. The recent advance of 5 per cent. in the wages of card-room operatives and spinners amounted to nearly $1,500,000 a year. The new schedule went into effect in May with the agreement that there was to be no change in wages for at least twelve months. There was a further understanding between the employers and spinners that an endeavor would be made on both sides to complete the conciliation scheme by which wages might be adjusted automatically to conform with the varying conditions of the cotton trade.

A Standard Wage List.

In connection with the recent advance of wages in the cotton mills of New England the question of establishing standard wage lists has been freely discussed and a growing sentiment has developed in favor of some equitable system for regulating piece prices to conform to the variations in the work. Such a system is entirely distinct from a sliding scale by which wages are automatically raised and lowered in accordance with a margin, or the difference between the cost of the raw material and the selling price of the manufactured product. Every piecework price list is a standard list. If the price paid for weaving a cut of cotton cloth is 18 cents for 64 picks, and fabrics of different texture are paid a corresponding rate in proportion to the picks per inch, that constitutes a standard list based on picks per inch.

There are, however, many other variations in the yarn, fabric, machinery and processes of manufacture that affect the amount of material that can be handled by a textile operative in a given time. These variations increase in number and importance with an increase in the diversity of the fabric, and the sentiment now growing in favor of the adoption of a standard list is for the extension of a fundamental and accepted principle of piecework wages. In the absence of such an extension of the standard list the adjustment of piecework prices to new fabrics and conditions of manufacture is made as occasions arise and according to special agreements between employer and operatives.

It is claimed that this lack of system is necessarily subject to abuses, that is is unfair to both manufacturer and operative. When a new fabric differing so widely from the old as to necessitate a new price is brought out, a piece price is fixed by the manufacturer. It is claimed by the operatives that in this way their wages are frequently reduced by reason of the different conditions of the work. It is certainly probable that injustice would result from this unsystematic method of adjusting wages to varying and complex conditions. In fact, it is difficult to imagine that injustice could be avoided under such a method of procedure.

It is by no means easy to establish a standard wage list for cotton goods, but the task is greatly simplified in this country because the history of standard lists in Lancashire is available as a guide. It is now nearly one hundred years since the first English list was established at Bolton. During that time the system has been developed in the hard school of experience by negotiation, study and, unfortunately, by long and disastrous strikes and lockouts. The result is the Lancashire standard lists as they exist today, admittedly imperfect in some respects, but regulated by Act of Parliament and possessing a remarkable adaptability to the wide range of fabrics and processes in the English cotton trade. The task of establishing a standard list in the American cotton industry is further simplified by the fact that the history of the Lancashire lists has been written by able and careful students of the subject. Among these none ranks higher than Prof. Sydney J. Chapman, dean of the faculty of commerce in the University of Manchester. No one can read what he has written and not be convinced of his fairness, ability, familiarity with the subject and single desire to state the facts with scientific accuracy. In his book, "The Lancashire Cotton Industry," he traces the development of standard lists in both the spinning and the weaving trade, and from this part of the work we take the following extract:

"It was said by David Holt, who was secretary of the Bolton Society for twenty-nine years, that the spinning list at Bolton dated from 1813, and that from the first it embodied the principle of discounts, but I have not succeeded in finding evidence corroborative of this statement.

"About 1830 the question of lists was being vigorously agitated, more especially with reference to discounts in prices varying with the number of spindles on the mule; but with that matter we have already dealt to some extent. Discounts had been slowly coming into use with the increasing length of mules. In 1830 the first attempt was made to secure an universal list; one was actually drawn up and adopted by the men, but though they decided to submit it to the masters it was never carried into effect. At this time the custom of paying by a district list was not general and some firms even worked without private lists. . . .

"Among the spinners, Bolton acquired a new list in 1844; Blackburn followed with one in 1852, and Preston in 1859. Burnley, Bury and Stockport had lists in 1867, while Hyde and Oldham waited until 1872. At Oldham it had been customary for each master to make a separate bargain with his workpeople; and the same custom prevailed in Preston prior to 1859. So late as 1875 many places were still without lists, and many firms disregarded them where they did not exist and used private lists. Some of the later lists were formed by the averaging of private or district lists, while the others were made up piecemeal from portions of those already existing; but at Oldham a new principle was adopted with which we shall deal hereafter. It must be remembered that all the spinning lists mentioned so far, both those of earlier and later times, referred solely to operatives on jennies or mules. It would be tedious to trace in detail the steps of development in spinning lists; suffice it to say that most incidents in the mill, which are not dependent on the operative, but tend to increase or decrease his work or his output are now taken into account in the lists."

The spread of present system of paying wages by the piece is thus referred to:

"The system of paying wages by piece has spread in the cotton industry. From the drawing frame to the loom piece-rates are almost universal. In the blowing-room and on the carding machines, however, the hands are still paid in time wages, for the reason no doubt that variations in the output are due much more to variations in the cotton and machinery than to the men's efforts. When quality is of great importance it is declared by some masters to be more economical to pay time wages even from the drawing frames, and to watch each hand and to vary wages with efficiency, so far as the demands of the trade unions leave it possible. In many cases ring spinners have acquired quite complicated lists on a small scale, according to which their wages vary as the speed of the spindle, the number of the spindles, and the size of the twist wheel.

"Piecer's wages are still definite weekly amounts. We must not fail to notice that greater accuracy in the system of payment by piece has been insured by the adoption of the 'Particulars Clause.' This clause first appeared in the Factory Act of 1891 and it then applied only to certain classes of workers in textile factories. By the Factory Act of 1895 it was given extended application and now it has statutory reference to all workers in textile factories who are paid piece rates. It may be extended to non-textile factories and workshops by order of the Secretary of State with such modifications as are deemed desirable. The clause declares that occupiers of factories must cause to be given to the operatives particulars of the rate of wages applicable to the work to be done by them and also particulars of the work to which that rate is to be applied, so that the operatives may be enabled to calculate for themselves the amount of wages due to them."

The greatest difficulties in forming a standard list are encountered in the case of weaver's wages because of the greater variety of work in the weaving process. This fact likewise makes the need of a standard list most pressing in the weave room, and it is therefore natural that the first call for a standard list in America comes from the weavers. It would be a great mistake to assume that wages can be regulated automatically by a standard list alone. The experience of Lancashire proves this to be impossible. On this point Prof. Chapman says:

"Although under the Oldham list masters tend to receive at first all the advantages resulting from improved machinery or better cotton, it does not follow that they retain them, for the men may condemn increased speeds as adding to their work and secure allowance, or they may move for an increase in standard rates. In point of fact wages are not determined automatically by the lists, detailed as they are: much is left to the manner of their application under the doctrine laid down by the amalgamation that the whole of the lists in force in the manufacturing districts are based on the supposition that fair material and appliances will be supplied to the hands so as to enable them to earn a fair wage. It scarcely need be said that in the case of weavers' wages still more depends upon mutual arrangements. For in manufacturing the number of factors affecting wages are greater than in spinning; the varieties of patterns are numerous and constantly changing and all incidents cannot therefore be taken into consideration in the lists."

The following extract from The Cotton Factory Times for August 2, 1895, is quoted by Prof. Chapman to show to what an extent it has been found necessary in practice to supplement the standard lists with constant adjustment to suit new conditions:

"The officials of trade unions connected with the cotton trade find a large proportion of their time taken up in attempting to fix reasonable prices for the varying and ever changing classes of work that are introduced almost every few months."

Another error that should be avoided is that under a standard list wages will in some way be automatically raised or lowered to suit varying conditions in the labor and goods market. Such changes are made in Lancashire under what is known as the Brookland's Agreement, which is distinct from the standard list. The most that can be expected from a standard list is to reduce the fixing of piecework prices to an equitable system as far as may be possible, to simplify the work of fixing fair prices for new kinds of work, and thus avoid the injustice that is sure to occur when the adjustment of piecework prices to the complex conditions of

textile manufacturing is made arbitrarily without any system of procedure.

At this time when the question is brought into prominence in this country it is important that a clear idea be formed by both employers and employes as to the nature and bounds of a standard list and for this reason a description of the system as applied to weavers' wages in Lancashire will be of value. For these details we are indebted to a book entitled "Uniform List of Prices for Weaving," compiled by T. Birtwistle, who was formerly an inspector of particulars under the British Factory Act.

THE STANDARD.

Certain particulars as to width of loom, reed space, reed, picks per inch, length of cut, size of warp and filling yarn are adopted as a basis for the standard list, and a piece price fixed for cloth made by that standard. The prices for other fabrics are then calculated by making additions to or reductions from that price in accordance with a system of allowances for variations from the standard conditions. The standard for the Lancashire list is as follows:

Loom: ordinarily made loom, 45-inch reed space.

Width: 39 to 41 inches.

Reed: 60 ends per inch, 2 in a dent.

Picks: 60 picks per inch, as calculated, with 1 1/2 per cent. added for contraction.

Length: 100 yards measured on a table.

Warp: 28s or finer.

Filling: 31s to 100s inclusive.

Price: 60 cents a cut or 1 cent a cut per pick.

ALLOWANCES FOR WIDTH OF LOOMS.

"A 45-inch reed space being taken as the standard, 1 1/2 per cent. shall be added for each inch up to and including 51 inches; 2 per cent. from 51 to 56 inches; 2 1/2 per cent. from 56 to 64 inches; and 3 per cent. from 64 to 72 inches. 1 1/4 per cent. shall be deducted for each inch from 45 to 37 inches inclusive, and 1 per cent. from 37 to 24 inches, below which no further deduction shall be made. For any fraction of an inch up to the half no addition or deduction shall be made, but if over the half the same shall be paid as if it were a full inch. All additions or deductions under this clause to be added to or taken from the price of the standard loom, 45 inches."

"All looms shall be allowed to weave to within 4 inches of the reed space, but whenever the difference between the width of the cloth and the reed space is less than 4 inches, it shall be paid as if the loom were 1 inch broader, and if less than 3 inches, as if it were 2 1/2 inches broader."

"When the cloth is from 7 to 15 inches inclusive narrower than the reed space of the loom in which it is being woven, a deduction in accordance with the following tables shall be made. No further deduction shall be made when cloth is more than 15 inches narrower than the reed space, or when the cloth is narrower than 18 inches. Fractions of an inch are not to be recognized under this clause. For example.—A 32 1/4-inch cloth should be reckoned as 33, 40 1/4 as 41, and so on with all other widths.

ALLOWANCES FOR REEDS.

"A 60 reed being taken as the standard, 3/4 per cent. shall be deducted for every two ends or counts of reed from 60 to 50, but no deduction shall be made below 50. 3/4 per cent. shall be added for every two ends or counts of reed from 60 to 68; 1 per cent. from 68 to 100; 1 1/2 per cent. from 100 to 110; and 2 per cent from 110 to 132. All additions or deductions under this clause to be added to or taken from the price of the standard, 60 reed."

"Cloths woven with one end in a dent to be paid three-quarters of the reed—thus a 80 reed one end in a dent would be paid for as a 60 reed."

ALLOWANCES FOR PICKS.

"Low: An addition of 1 per cent. shall be made for each pick or fraction of a pick below 11, thus:

Below 11 to 10 in.	1%
Below 10 to 9 in.	2%
Below 9 to 8 in.	3%
Below 8 to 7 in.	4%

and so on, adding 1 per cent. for each pick or fraction thereof.

High: An addition of 1 per cent. per pick shall be made whenever they exceed the following, if using weft below 26s when picks

exceed 16; weft 26s to 39s inclusive when picks exceed 18; weft 40s and above when picks exceed 20.

In making additions for high picks any fraction of a pick less than the half shall not have any allowance; exactly the half shall have 1/2 per cent. added; any fraction over the half shall have the full 1 per cent. added."

ALLOWANCES FOR COUNTS OF WARP YARN.

The standard being 28s or finer, the following additions shall be made when coarser twist is woven in the following reeds:

Below 28s to 20s:
64 to 67 reed, inc. 1%
68 to 71 reed, inc. 2%
72 to 75 reed, inc. 3%
Below 20s to 14s:
56 to 59 reed, inc. 1%
60 to 63 reed, inc. 2%
64 to 67 reed, inc. 3%

and so on at the same rate. When twist is woven in coarser reeds no addition shall be made. The above prices are for single and two-fold yarns. When three-fold yarns are woven one end in a dent, one-half of the above percentages to be added."

ALLOWANCES FOR FILLING YARNS.

Ordinary Pin Cops: The standard being 31s to 100s both inclusive shall be reckoned equal. Above 100s 1 per cent. shall be added for every 10 hanks or fraction thereof. In lower numbers than 31s the following additions shall be made:

For 30s,	add	1	per cent.
For 29s, 28s,	add	2	per cent.
For 27s, 26s,	add	3	per cent.
For 25s, 24s,	add	4.5	per cent.
For 23s, 22s,	add	6.5	per cent.
For 21s, 20s,	add	8	per cent.
For 19s, 18s,	add	10.5	per cent.
For 17s, 16s,	add	13	per cent.
For 15s, 14s,	add	16	per cent.
For 13s,	add	18	per cent.
For 12s,	add	21	per cent.
For 11s,	add	25	per cent.
For 10s,	add	30	per cent.
For 9s,	add	38	per cent.
For 8s,	add	48	per cent.
For 7s,	add	61	per cent.
For 6s,	add	76	per cent.
For 5s,	add	94	per cent.

Large Cops: When weft of the following counts is spun into large cops so that there are not more than 22 in one pound, the following additions shall be made in place of the allowance provided for pin cops in the preceding table:

For 29s, 28s,	add	1	per cent.
For 27s, 26s,	add	2	per cent.
For 25s, 24s, 23s,	add	3	per cent.
For 22s, 21s, 20s,	add	4.5	per cent.
For 19s, 18s,	add	6	per cent.
For 17s, 16s,	add	8	per cent.
For 15s, 14s,	add	10	per cent.
For 13s,	add	12	per cent.
For 12s,	add	15	per cent.
For 11s,	add	19	per cent.
For 10s,	add	24	per cent.
For 9s,	add	30	per cent.
For 8s,	add	38	per cent.
For 7s,	add	48	per cent.
For 6s,	add	61	per cent.
For 5s,	add	76	per cent.
For 4s,	add	94	per cent.

ALLOWANCES FOR WEAVES.

Low Picks: In four-staved twills an addition of 1 per cent. for each pick or fraction thereof below the picks mentioned in the following table shall be made when using weft as follows:

Low picks:
Below 26s,.....begin at 13
26s to 39s,.....begin at 14
40s,.....begin at 15
High picks:
Below 26s,.....begin at 21
26s to 39s,.....begin at 22
40s and above,....begin at 23

High Picks: When using weft below 26s the addition for high picks shall begin at 21; 26s to 39s inclusive the addition for high picks shall begin at 22; 40s and above the addition for high picks shall begin at 23.

In making additions for high picks, any fraction of a pick less than the half shall not have any allowance; exactly the half shall have 1/2 per cent. added; any fraction over the half shall have the full 1 per cent. added.

HERRINGBONE TWILLS.

For weaving cloths known as herringbone twills, four staves, 5 per cent. extra on twill cloth prices shall be paid.

COLORED EDGES OR BORDERS.

Colored edges or borders with one or more colored ends at the side shall be paid 5 per cent. on plain cloth prices.

SPLITS.

The following additions shall be made for splits:

One split, uncut, ... add 5 %
Two splits, uncut, ... add 7½%

and so on at the same rate.

Empty dents only shall not be considered splits.

ALLOWANCE FOR JACQUARD WORK.

Basis: Uniform list with the following modifications: Plain and satin grounds 25 per cent.; single lift machines 35 per cent.

When cloths, satin ground. are woven with three or more ends in a dent, the allowance for every two ends or counts of reed above 68 shall be 3/4 per cent. only, the same as from 60 to 68.

Picks: Uniform list up to and including 30 picks, from 30 to 40, 3/4 per cent. per pick, all above 40, 1/2 per cent. per pick.

Mock lenos and lace brocades to be paid 5 per cent. extra.

Any other goods of a difficult character to be paid extra, the amount of which shall be fixed upon by the Employers' and Operatives' Associations.

Pick Finding: Where the employer requires the loom to be turned in order to find the broken picks, the following percentages to be paid:

18s or finer weft, ... 7½%
17s to 12s ..... 10 %
11s or under 12½%

For two beams 5 per cent. extra; three beams, 10 per cent. extra. Lenos, loops and crimps excepted.

For colored goods a new standard and a new system of allowances for variations are used. Lack of space prevents our giving these details here. Those parts of the standard list for plain work that we have given illustrate the principles on which the English list is based, and will show the character of the problem involved in framing a standard list for work in American mills.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

A number of lines of light weights have been opened, but no marked developments have yet occurred to denote either strength or weakness; and no two selling agents agree as to probable outcome.

It is said that one or two lines have attracted the attention of buyers to the extent that at this early date sufficient orders have been booked to absorb production. What buying has been done has principally been on serges. As regards prices few numbers are shown on a parity with last year, others show an advance of five cents to ten cents a yard above last year's opening quotations. Buyers have also operated rather freely on cotton worsteds and some good size orders are reported to have been booked. This fabric has been generally advanced about 10 per cent. The styles are uniformly good and fully deserve the support they have received.

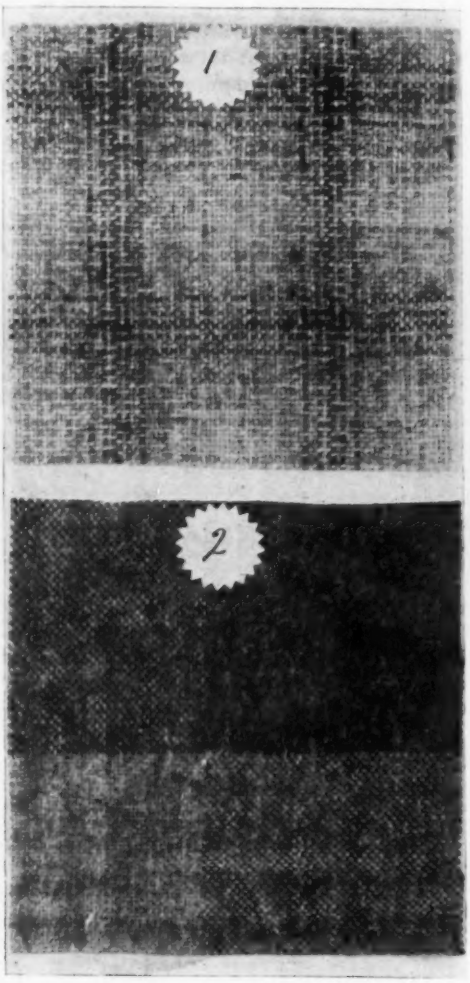
Among the more important openings has been the American Woolen Co.'s lines of serges from the Washington and Fulton mills and raincoatings and manipulated mixtures in Department A division 1, and the showing of the Saxonville serges by the Earnscliffe Worsted Company; these serges range in weight from 11 to 16 ounces, and in price from 95 cents to $1.25 with an advance of about 7 1/2 per cent. over last year's opening price.

One of the lines reported withdrawn are the serges shown by Walter Hoffman from the Fred L. Sayles' mill, price ranging from $1.15 to $1.42 1/2.

Stevens, Sanford & Jordan are showing their lines of serges from $1.32 1/2 to $1.50; the H. C. Rockwell department of the

same house has opened two lines of cotton and mercerized worsteds, known as the Claremont suitings and trouserings at 65 cents, and the Kenwell's grey tropical suitings, at 92 1/2 cents.

W. W. Capers, Jr., department of Bacon & Co. has opened the Royal flannels at 72 1/2 cents and the Waverly worsteds at 29 cents, 32 1/2 and 75 cents.



R. A. Weise department Battelle, Hurd & Co. is showing 12-ounce wool and silk mixtures at $1.00 and $1.05.

H. W. T. Mali & Co. have advanced Rhode Island raincoatings five cents a yard.

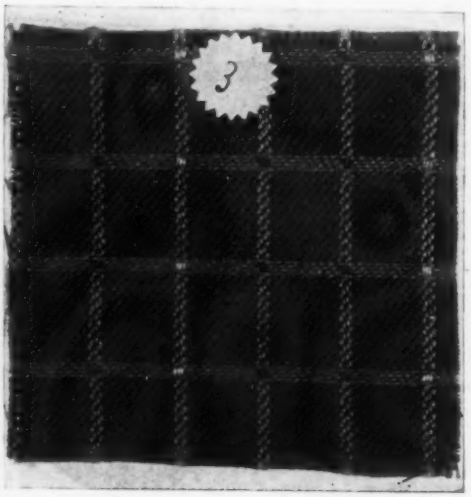
The Coronet Worsted Company are showing the Plainfield serges at 97 1/2 cents to $1.50 with advances of 2 1/2 to 5 cents over last year's opening quotations.

Morton H. Mainhard & Co. have opened their fall line of serges at an advance of 5 per cent. to 10 per cent.

David M. Look department James Tolcott & Co. are showing 14 ounce unfinished worsteds at $1.20.

H. C. Dickson has opened the Westport worsteds 60 inches wide at 92 1/2 cents.

Vreeland & Wilson department H. Bauendahl & Co. have opened the Cushla manipulated worsteds and Cushla cassimeres at 67 1/2 cents.



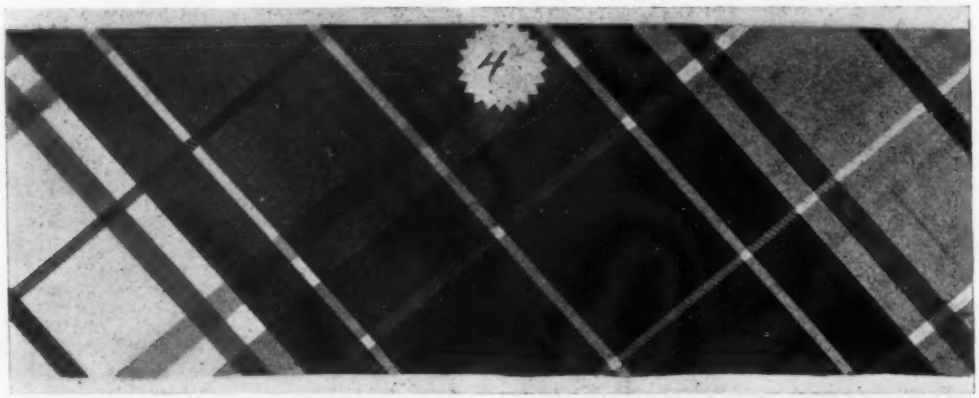
Kunhardt & Stockton are showing Masonville manipulated suitings at $1.17 1/2 a yard.

Snedeker & Orchard have opened brilliant worsteds at 32 1/2 cents; Dolphin 3/4 cotton warp cassimeres at 20 cents; Regina outing flannels, 6/4 at 45 cents.

DRESS GOODS.

The market on dress goods has not yet opened up to any extent, and there are comparatively few light weights shown; hence there is but little activity in evidence, but the condition is perfectly normal, and to be expected at this period of the year. It is generally stated throughout the district that the business gathered for fall is fully up to expectations, and therefore satisfactory.

Fancies have gained very materially in favor during the last two months and it now looks as if the prediction made earlier in the season that plain fabrics would rule is not going to be fulfilled. During the early spring there arose a strong call for small grey overchecks and irregular small grey checks; this demand has broadened out until recently the mills have introduced a large variety of shadow checks, shadow plaids and ombres, mostly all in the two toned grey shades, such as are shown in Fig. 1. This particular fabric is shown by Deering Miliken 44 inches wide at 47 1/2 cents and has proved one of the most successful fabrics of the season. Fig. 2 shows the same order of goods in better grades by the same house; this comes 54 inches wide at $1.00.



It is stated by the selling agents of the Empire Worsted Mills that they have secured record breaking business for fall; this mill makes a specialty of fancy weaves at popular prices, such as Fig. 3, 36 inches wide at 36 cents.

The Gera Mills production is sold by C. H. Bahnsen, and there has been no lack of orders for fall; the question is how to deliver all the business that has been booked. The Botany Worsted Mills also report very satisfactory business on broadcloths, royal henriettas and their general line throughout.

SILKS.

The outlook for fall business is little better, although the conditions still remain very unfavorable. Large lots of broad silks are offered at market concessions to clear before the semi-annual stock taking, notwithstanding the high figure of the raw material. On the whole the prices were never lower.

It is stated throughout the district that a large number of the smaller concerns have dropped out for lack of support. A desire has been shown on the part of one of the principal mills to unite for self preservation by adopting some means to control output and prevent goods from being sold at ruinous prices. It is not probable that this will be brought about, as there exists in the trade many conflicting elements that will be hard to reconcile. The situation as outlined above is the general condition of things. A few mills, which can be counted on one's fingers, have had a successful season and have made money; these mills make standard high grade goods known throughout the trade for their excellence and wearing qualities.

Fig. 4 shows a Clan tartan made by M. C. Migel, 20 inches wide at 70 cents. Fig. 5 is a novelty brought out by Valentine & Bentley, 20 inches wide, at 92 1/2 cents. This is an ordinary black and white check interwoven with Persian colorings in jacquard designs.

COTTON GOODS.

The market is irregular and uncertain, though the tendency is toward a lower level, more especially on coarse grade goods.

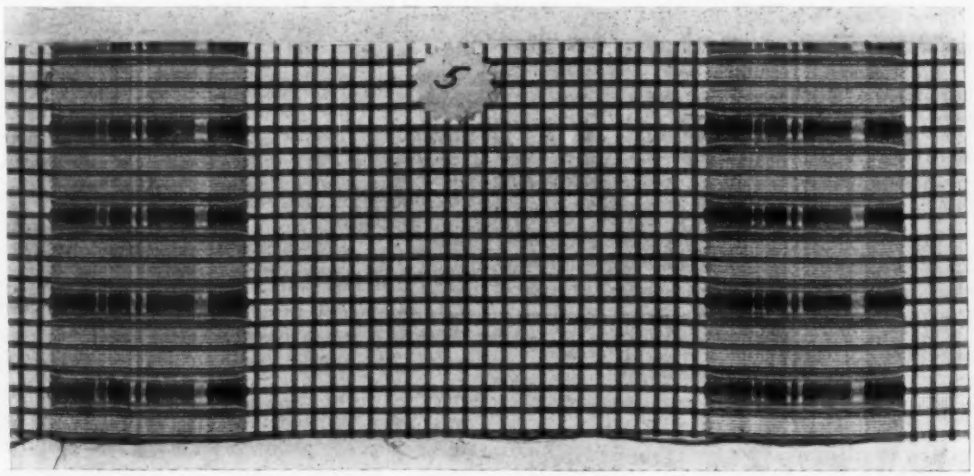
A decline has taken place on nearly all lines of tickings, brown sheetings, and one or two tickets of bleached sheetings.

The most important to the trade has been

the concession by the American Printing Co. on standard prints. Every time a buyer pays more than 5 cents a yard for such goods, he justly feels that he is being compelled to pay more than the goods are worth, with the result that other cotton wash fabrics are sold to the customer whenever possible.

Both dress and staple check ginghams are very active, and the demand until recently has been greater than the supply.

The jobbers report having done very satisfactory business on all lines of printed lawns and goods of allied character without resorting to sacrifice on price. Clean stocks are the rule; apparently very little has been carried over.



Orders are now being taken on India linons, Persian lawns for next spring delivery; a wider demand for these sheer goods is continually on the increase as well as on sheer mulls, French mulls, mercerized batistes, piques and dimities.

The collections of jacquard and fancy weaves are not yet complete.

LININGS.

The lining division of the market is in a very prosperous condition, and the converters report difficulty in securing grey goods sufficiently to fill their orders.

Mercerized finished fabrics are taken in liberal quantities, while the clothiers have been in the market for mohairs and sicilians in fairly liberal quantities.

Prices are well maintained, the only exception being kid finished cambrics which are 1/4 cent easier.

Crinolines and goods on that order are scarce and have been for a few weeks completely out.

CALCULATING THE COST OF WORSTED COATINGS.

(Specially Written for the Textile World Record.)

It is well known that the present Dingley tariff administered a heavy blow to Yorkshire manufacturers of worsted coatings. Instead of the monthly totals of £20,000 to £50,000 worth exported, the average is now about £5,000. It is solely the heavy import duty that is at present keeping Bradford-made worsted coatings out of the American market, though Yorkshire producers admit that American manufacturers have made considerable headway in producing what are commonly known as "Clay twills." At the same time a few of the medium class fabrics are still finding their way across the Atlantic, hence a few particulars of how these goods are made, or as to the cost of producing them, will be of interest.

Worsted coatings are not being made today in anything like the bulk that they were seven to ten years ago. At the same time there are other cloths such as serges, vicunas, and the endless variety of tweeds that have put worsted coatings into the background.

The following is the price list of clay twills in the English market:

FAST BLACK WORSTEDS.

Width. Inches.	Weight. Ounces.	December 1905. Cents.
56	12	63
56	14	69
56	16	76
56	18	82
56	20	90

At the beginning of 1902, when crossbred wool was at the bottom, any of the above cloths were selling at 14 to 18 cents per yard less, according to weight, than today. The cost of these goods is shown by the following figures, taken from the records of a Bradford manufacturer. Each set of figures represents a different character of worsted coatings. The cost of the Botany yarns used was on a much lower scale than today, but the manufacturer gets on these better class goods an advance equivalent to the increased cost of the raw material.

The first cloth is a worsted coating, very smart and fashionable, one that has sold very well for making good average suits, and weighing 20 to 21 ounces per yard, dyed a good fast black in all cases:

Warp, 43 lbs. 2/48s at 52c.	$22.36
Weft, 29 lbs. 1/30s at 46c.	13.34
Total cost of materials	$35.70
Weaving	7.44
Mending	1.20
Dyeing and finishing	5.76
Total cost of producing	$50.10
Estimated mill expenses, etc.	4.98
Total cost of production	$55.08
52 1/2 yds. coating at $1.12 per yd.	58.80
Cost	55.08
Profit	$3.72

The next cloth is a black corkscrew worsted coating, a style of fabric that is selling today as well as any in this class of goods. The weight when finished is 23 to 24 ounces, which is just a shade too heavy, the general tendency today being to wear a rather lighter fabric. However, the cloth is made regularly, so it must have a sale. The cost particulars are as follows:

Face warp, 34 lbs. 2/48s at 55c.	$18.70
Backing, 19 lbs. 2/40s at 50c.	9.50
Weft, 26 lbs. 1/30s at 51c.	12.74
Total cost of materials	$40.94
Weaving	6.96
Mending	1.20
Dyeing and finishing	5.76
Total cost of producing	$54.86
Mill expenses, etc.	5.56
Total cost of production	$60.42
51 yds. of cloth at $1.24 per yd.	$63.24
Cost	60.42
Profit	$2.82

American manufacturers will probably say that the above do not show a large amount of profit; here it is considered fairly good. If they can run their mill full time and sell their pieces at cost price, many Yorkshire manufacturers are satisfied. What are known here as "mill profits" amount to a fairly respectable total at the year end, and this is quite sufficient to satisfy a large number, while a dollar a piece profit in addition is doubly welcome. Things have to be cut very fine nowadays for a man to run his mill, and this is all the more so when a firm is making low class goods. Those who can find a sale for real good cloths do very well, but this year times have been really bad for our manufacturers owing to the advance of wool and their inability to obtain a corresponding advance for the raw material. A time of cheaper wool would be doubly welcome, and this seems to be expected when the weight of the next Australasian and River Plate new clips come on the market.

The value of Japanese woven silks exported to Europe and America is estimated at more than fifteen million dollars per annum.

THE SALE OF LINEN SUBSTITUTES IN MELBOURNE.

BY W. PERCY WILKINSON, Government Analyst for Victoria.

(A Report to the Board of Public Health, Victoria.)

The board's inspectors, acting under the instructions of the chairman (Dr. Gresswell), recently handed me portions of certain articles of merchandise for examination. The goods comprised collars, handkerchiefs, and serviettes, sealed and marked as described in the subjoined statement. The sample portions represented five collars, four handkerchiefs and three serviettes. It is understood that the inspectors, when purchasing, asked the vendors for linen goods and received assurances as to their genuineness.

The nature of the materials was ascertained by examination of the fibres constituting the threads of the warp and weft, following the detailed particulars serving for the identification of various plant-fibres used in the manufacture of textiles, according to Lunge, Chemischtechnische Untersuchungsnethoden Bd. 3, 1900 pp. 1026-1056.

The results of the examinations are shown in the following summary.

1.—Man's Collar	Cotton
2.—Man's Collar	Cotton
3.—Man's Collar	Cotton
4.—Man's Collar	Cotton
5.—Man's Collar	Cotton
6.—Handkerchief	Flax
7.—Handkerchief	Cotton
8.—Handkerchief	Flax
9.—Handkerchief	Cotton
10.—Serviette	Cotton and Flax (Union)
11.—Serviette	Flax
12.—Serviette	Cotton and Flax (Union)

The five collars, purchased by the inspectors, were of the usual four-fold type; the back, front and interlinings in each case consisted entirely of cotton. Two out of the four handkerchiefs were made of flax, the other two contained cotton only. One out of the three serviettes was made of flax, the remaining two were woven of a mixture of flax and cotton (so-called "union" goods).

Bearing in mind that the inspectors specifically asked for linen, when purchasing, it becomes of importance to ascertain the meaning attached to the word "linen."

According to Skeat (Etymol. Dict. of the English language) linen is "a cloth made from flax. The word linen is used as a substantive, but is really an old adjective; the old substantive in Middle English (13th to 15th centuries, inclusive) being lin, and the Anglo-Saxon, lin, flax." The cultivation of flax dates from remote antiquity; de Candolle (Origin of Cultivated Plants) states that "a variety was cultivated in Europe by peoples more ancient than the conquerors of the Aryan race. The name lin (with slight alteration only) exists in all the European languages of Aryan origin of the centre and south of Europe, Keltic, Slavonic, Greek and Latin. Flax has been found in a tomb of ancient Chaldea prior to the existence of Babylon, and its use in that district is lost in the remotest antiquity. In Greece, at the time of the Trojan war, fine linen stuffs were imported from Colchis. In the last centuries before the Christian era the Romans procured very fine linen from Spain." Fabrics made from flax have been known from time immemorial. Four thousand years ago Egyptian artists depicted the cultivation, spinning and weaving of flax, and the cloths in which the Egyptian mummies are swathed consist of fine linen.

It is stated by Warden that "the art of making and the custom of wearing linen were probably brought into England by the Belgic colonists, about a century before the Roman invasion," and that "the Emperors of Rome were usually at great pains to improve the condition of their foreign subjects. They imported, or sought out, among the inhabitants themselves, the most skilful artificers in every department, especially the best manufacturers of woolen and linen cloth and formed them into colleges or corporations. . . . The chief officer in each college was called the Court of the Sacred Largesses, and his business was to see that a certain quantity of cloth, of various kinds, was regularly produced for the use of the court and of the army. Such an imperial manufacture was established in England, at Neuta Belgarum, now called Winchester."

The manufacture of wearing apparel from

flax was of some magnitude at the beginning of the thirteenth century in England. It is interesting to note that in the time of Edward III. (1362) "the export of linen yarns from Liverpool was prohibited by order of the government." Linen was an article of extensive manufacture in England for centuries previous to the manufacture of cotton cloths. We have to wait until 1641 before we find any mention of cotton manufacture.

These brief historical notes are sufficient to indicate that the meaning of the word linen has been extremely clear for many centuries. There can be no doubt as to its nature or of the substance from which it is believed by the public to be made.

Linen has always enjoyed a household reputation for durability, wear and appearance. This is due to the nature of the flax fibre, which is rather cylindrical, very smooth and shiny. Cotton, on the other hand, resembles a flattened tube irregularly twisted with uneven edges. These natural properties determine the quality of glossiness, so well known of linen, and the dulness of cotton goods under the same conditions (apart from stiffening and polishing with starch, wax, paraffin, etc.), as well as the different technical operations adopted in weaving these fibres.

Of late years there has been a marked tendency to substitute part of the flax in linen with cotton. The origin of this practice is hardly to be sought in any alleged superiority in the durability or appearance of cotton, but rather in its lower price. Manufacturers, however, have not rested with the partial substitution of the more expensive flax. Goods woven to resemble linen in all its grades of fineness are now made wholly of cotton. So cleverly is this substituted and imitated product woven that in the case of bleached and dressed cloth it requires a trained eye to distinguish between an all flax, union and cotton substitute. Persons demanding linen and linen goods buy, in the great majority of cases, in good faith. It is not practical for the housewife in her shopping to carry, from shop to shop, a powerful microscope and chemical reagents, in order to test the quality or genuineness of the tablecloths, serviettes, handkerchiefs, or other articles for household use offered for sale as linen.

Purchasers are entirely at the mercy of the vendors, and it is recognized that no two tradesmen take exactly the same view of profits. It appears extremely advisable that all linen and articles made of linen should be so stamped or marked as to prevent any possibility of the purchaser being deceived by unscrupulous traders. Substitution of flax, partly or wholly, by any cheaper fibre in goods resembling linen, should be declared in an unmistakable manner by stamping or marking each article or each running yard with the name of the substitute or extent to which it is present.

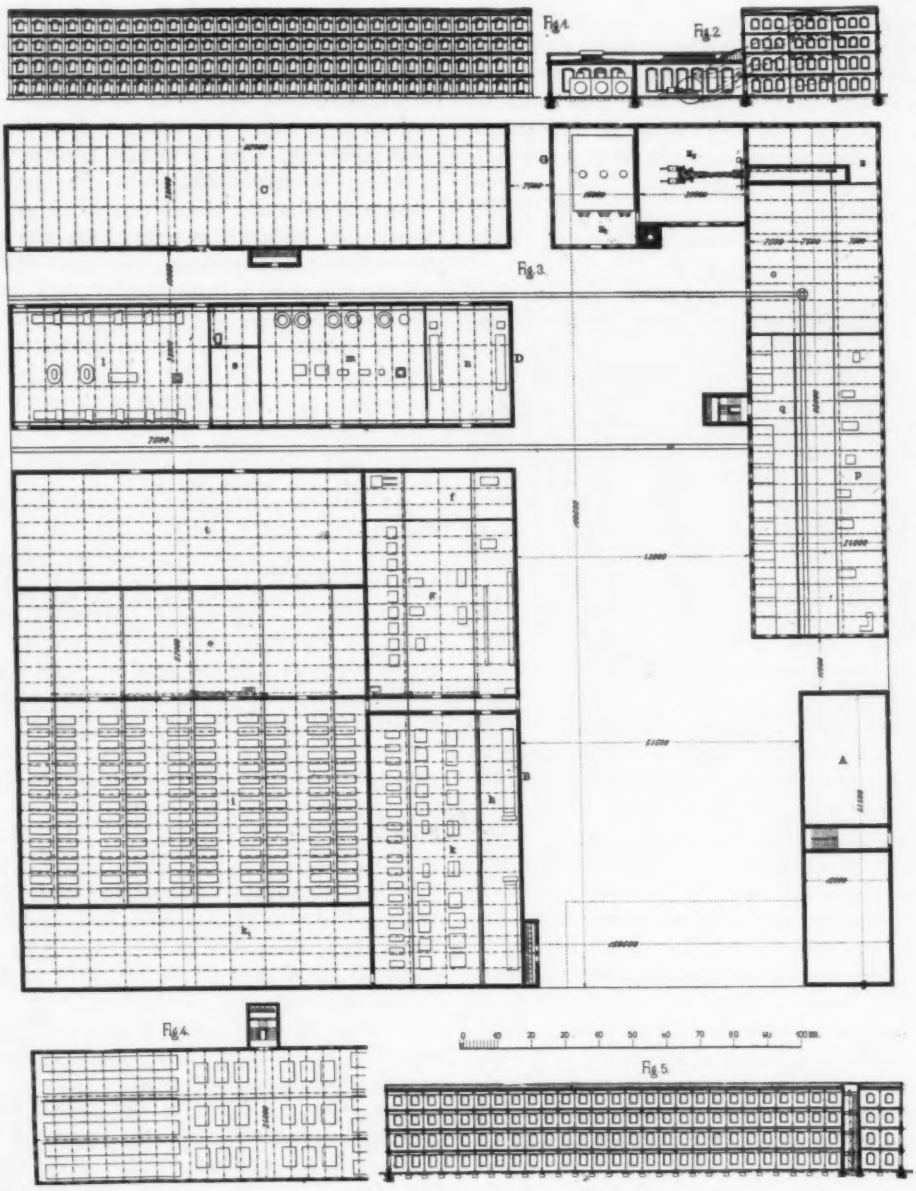
With regard to the present instances of the sale of cotton goods as linen, it appears desirable, with the object of protecting the public, as well as honest merchants, that prosecutions should be instituted without delay. This could be done under the Tradesmarks Act, 1890, Part II., Sections 12, 13 and 15, charging the vendors with "applying false trade descriptions to goods," as provided for under those sections. The penalties on conviction for offences of this nature are heavy, and, if the cases herein reported were successfully conducted, they would have a deterrent effect on the continuation of the fraudulent practice of selling cotton as linen.

PLAN OF A WOOLEN MILL.

The accompanying plans are for a 150-loom weaving mill combining all the processes necessary to convert the raw material into the finished goods. The yarn mill is a four-story building, the looms being in a weave shed. The spinning mill is driven direct from the engine; the machinery in the scouring, weaving and finishing rooms is driven by electric power. The room, C, is used for the storage of raw wool and for the sorting room. Separated by a passageway, but extending in the same line, is the building, D, in which are the scouring room, l, pattern room, s, and the motor room which contains the motor for driving the scouring and dyeing machinery. The adjoining room, m, is used for the dyehouse and next it is the dry room, n.

The wool is then taken to the picking room on the first floor, p, of the four-story spinning mill, G. The room, O, is used for the storage of colored wool; the room, q, for picked wool, in which are eleven bins for the different batches. The stairway and toilet rooms are located in the tower adjoining this room.

As shown at Fig. 4, the upper story of the spinning mill is used for carding and spinning. In the centre are six sets of cards and on each side six spinning machines. The spinning machinery is driven from the power house, z^2, by power transmission ropes enclosed outside the building as shown at Fig. 2. The yarn is taken to the storeroom, g,



adjoining the spooling and warping room, e, next to which is the weave room, i, which contains 150 looms. The room, k', is used for burling and sewing. The wet finishing room, k, has 18 washers, 11 fulling mills and 10 gigs. The drying machines are in the room, h. The dry finishing room, g, is separated from the wet finishing room by a narrow passageway. The room, f, is used for the sponging and steaming of the goods. The finished goods are stored in a separate building in the room, A.—Uhland's Technische Rundschau.

RAMIE.

BY FELICIEN MICHOTTE, Ingenieur des Arts et Manufactures.

Much has been written on the subject of ramie since 1815 when the first attempt was made to utilize it, and vast sums of money have been lost in futile attempts to work the material. It is an error, however, to assume that no progress has been made. The manufacture of ramie is an established industry and prospering under very adverse conditions. There have been many failures, but material progress has been made. The causes of the failures are in most cases evident. Attempts have been made to work the fibre before having studied the problem. Likewise in many cases the object has been to sell stock to the public under false pretenses instead of selling ramie, and I am free to assert that until very recently ramie has served chiefly to decorticate capital and degum the capitalists.

The trouble has been that nearly every exploiter has sought by false statements to sell a particular machine or process without merit. The ramie Congress held at Paris in 1900 had an opportunity to perform a great service if it had confined itself to the cultivation of ramie. It, however, became a fizzle and every page of the proceedings contains contradictory statements, thanks to the efforts of the promoters of special processes and machines. In order that the public might not see the tips of the ears, the whole subject was involved in a discussion of spinning, the one thing which should not have been discussed, because it was putting the plough before the ox. Further there was no one present competent to discuss the spinning process intelligently, and consequently anyone was at liberty to utter the rankest heresies. The publication of Traite Scientifique et Industriel de la Ramie, marks the first serious discussion of the subject from a scientific and industrial standpoint.

Ramie grows in China and there are several varieties. The stem of the plant is hollow and is filled with soft substance surrounded by walls consisting of three divisions. The central layer encloses the textile fibres which are known as ramie. The yield of the stems is as follows:

	Green, not stripped. Per cent.	Green, stripped. Per cent.	Dry. Per cent.
Leaves	30 to 45		
Dry stems	10	20	
Green strips	10 to 15	20 to 30	
Dry strips	2.5 to 3.5	5 to 7	25
Fibres	1.25 to 2	2.5 to 3.5	12 to 15

As will be seen by this table the green stems yield from 1 1/4 to 2 per cent. of fibre. This is a very important point on which the solution of the problem hinges. Ramie can be raised on a wide area extending 50 degrees each side of the equator and the yield is proportionate to the average temperature. Between 12 and 14 degrees one cutting is possible; between 16 and 18 degrees, three cuttings; between 22 and 24 degrees, six cuttings; and even eight cuttings can be obtained between 26 and 28 degrees. This has been proved by experience. Ramie is a tropical plant and its cultivation is not advisable unless three cuttings can be made per year. It requires a light, rich, deep and sandy soil, heat and humidity. The yield amounts to 26 3/4 to 44 1/2 tons of green stems per acre and under favorable conditions from 1000 to 1300 pounds of fibre per acre can be obtained per cutting or as high as 5200 pounds for four cuts.

The labor problem is the most serious problem connected with the cultivation of ramie. This is evident when it is considered that from 132,276 to 220,460 pounds of stems must be handled in order to obtain 2600 to 3300 pounds of fibre. Two methods of treating the stems have been proposed;

one consists in removing the bark after drying the stems, the other in removing it immediately after cutting. The first process is called the dry treatment; the second is the green treatment. The dry treatment was the first to be used and is the one that has caused more trouble than anything else. One company formed in France which employed the dry treatment lost several million francs. The principle of the dry process is radically wrong. Drying the stems removes 80 per cent. of the weight on account of the evaporation of water. The difficulty of evaporating such an immense quantity of water is evident to every practical man. All the attempts have failed and the last one made on the Belgian Congo has been as fruitless as the preceding ones. Even admitting that the drying could be effected, the labor and expense would be ruinous.

The wet process is unquestionably the most economical and in fact the only one that is practical. It is the only one that has been attended with success and it is by this process that the Chinese treat China grass. An innumerable number of machines have been built for decorticating ramie, but only a few have given good results, probably not more than four or five which have been brought out in France since 1889. The first condition of success is a high production. The machine must be simple in construction and easily transportable.

Previous to 1889 all the machines were built with a retrograde movement, that is to say, the stems were run into the machine for two thirds of their length, then the movement was automatically reversed and the stems were removed and turned end for end in the crushing rollers. This system was open to the objection that but a few stems, five or six, could be treated together, while the complete process consisted in reality of four or five distinct operations. Another machine of the same type produced scarcely twenty-two pounds per day. In 1900 the Faure machine was the only one of this system still in use, the others used at that time being built for a direct movement. In the direct movement machine the stems are passed between the rollers, then through a beater and completely decorticated at one passage. This type was invented in 1889 and is known as the Michotte, being named for the inventor. The advantage of this machine is that the operation consists of but a single passage through the machine, requiring but one-fourth of the time taken by the retrograde movement. Instead of only five or six stems it is possible to feed from fifteen to one hundred at a time. The production is at least twenty times as large as that of the preceding process. Moreover the Michotte machine is simple in construction and dispenses almost entirely with manual labor. In 1900 there were three machines of the Michotte type on the market. Of these, La Francaise, Fig. 1, is the machine which at present is giving the best results. It has been greatly improved since 1889.

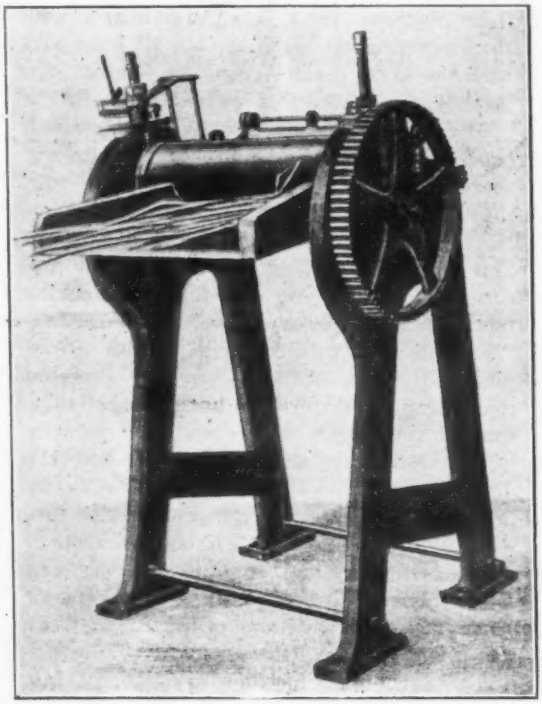


FIG. 1.

Two feed rolls deliver the stems to a beater which revolves against a second and fixed beater. The machine is very light, weighing less than 900 pounds, and can be easily transported. Besides doing the work well

the production is large, amounting to 2200 -2700 pounds of green stems per hour with one attendant. This is equal to 440 pounds of green fibre per day, making the cost of the process very low. The yield from an acre can be handled by one man in two or three days. The machine is in use in Tonquin, Argentine and Uruguay. The Faure, a retrograde movement machine, has been remodeled and adapted for direct movement. This is a substantial recognition of the merits of the Michotte machine. There have been processes for doing away entirely with the decorticating machine, but all have met with the same result—complete failure. No method based on this principle should be considered seriously. The inventors of such processes generally treat them as profound secrets, usually for the simple reason that they do not know anything about them themselves. One schemer went so far as to claim that he could degum ramie without machines, apparatus, or chemical products by methods as simple as those of retting flax. This has not resulted in a pound of degummed ramie. Other processes consisted in soaking the material in hot chemical solutions, losing sight of the immense quantity of material that must be treated and the quantity of water that would have to be heated. One enthusiastic inventor came forward with a request for $10,000 with which to demonstrate the possibility of retting ramie in sea water. Another in 1900 was taken seriously when he proposed to treat the ramie in kiers, subjecting it to the action of carbonic acid, then drying, crushing and sorting the fibre by hand. Hence no decorticating machines.

Having completed the decorticating process the product is subjected to a process for preparing it for spinning, the object being to separate the ramie from the gums that surround it. Here also there were numerous quick methods proposed, being nothing more than boiling-off processes which have given no satisfactory results. Two problems present themselves in degumming: 1, degumming of China grass; 2, degumming of the decorticated product. The degumming of China grass is easy. The outer husk of the plant being removed, there remains only to dissolve the gums, which is easily done. At present there are six mills in France, one in Germany and one in England in which this operation is carried on. All are working on the same principle. The material is placed in kiers, treated under pressure with diverse soap solutions, the pressure varying from twenty-five to fifty pounds per square inch, and the time being from one and one-half to three hours. In some mills the treatment in a weak acid solution is included, the time varying from one-half to several hours. The best process is that invented by Michotte and Urbain, the total time occupied being about three hours, and is now in use in their factory in Etampes, France.

The degumming of the decorticated stock presents the same complicated problems. It is necessary to dissolve the outer bark. Only one process, that of Michotte and Urbain and likewise in use in their mill at Etampes, has given good results. The fibre is treated in a kier under pressure for 2 1/2 to 3 hours; the material is then washed in a standing bath for one-quarter of an hour and then rinsed in running water. The kier holds 400 pounds at one time, giving a production of about 1300 pounds per day.

All the ramie consumed in Europe has thus far come from China and Tonquin under the name of China grass. Previous to 1900 China grass was worth from $100 to $140 per ton; today it is selling for $160 to $220 per ton. The loss of 30 per cent. in degumming makes the cost of the degummed stock $240 to $320 per ton, to which must be added the cost of the process, amounting to $60 to $80 per ton, making a total cost of $300 to $400 per ton. Ramie is more expensive than other vegetable fibres and for this reason will be used only for special purposes and there is no fear that it will compete with linen. The ramie fibre is very long, but not so fine as other vegetable fibres. This length, amounting to eight inches on the average, makes it very durable. The interior canal is very large and regular, forming about four-fifths of the total diameter. Ramie is much whiter and more brilliant than linen. The comparative strength of the

various textile fibres is shown by the following comparative table, ramie being taken as unity:

	Width.	Traction.	Elasticity.	Torsion.
Ramie	1	1	1	1
Flax	½	½	½	¼
Hemp	⅝	¼	½	1
Cotton	½	1/11	1	4
Silk	¼	1/14	4	6

This table shows that ramie occupies a special position among the textile fibres. It is too coarse to take the place of flax and cannot be compared with cotton or hemp. It bears a slight resemblance to silk, being much coarser and more durable. Moreover, it does not absorb weighting material. At the present time ramie has come into competition with silk only in upholstery and knit goods. It has displaced linen for certain articles of luxury and is actually sold in Germany under the name of "extra linen." Special articles such as incandescent mantles have been manufactured from the material and it is also employed in knit goods and combined with wool to give mixed effects in piece dyes. The indications are that the consumption of ramie products will increase steadily. There being no statistics of exports and imports to guide us the present extent of the industry can be estimated only by the mills which are in operation. In Germany there is the Gesellschaft Bomen. It spins up to 36s English cotton number, and pays dividends of 7 per cent. In France a mill at Roubaix has been spinning ramie along side of linen for two years. At Lille there is a spinning mill which is closed, the proprietor having been ruined by unsuccessful attempts to manufacture dry ramie into special articles. In the Department of the Seine Inferieure near Rouen, there is a mill which degums and combs China grass and supplies the Bank of France with material for the French currency. There is also an old mill established under the name of Ramie Francaise which afterwards passed into the possession of Favier & Co. It spins China grass. The production is about 1100 pounds per day. At Lyon there is a spinning mill which is working China grass for special yarn and cordage. The production of all these mills is limited by the supply of the raw material and not by the limit of the demand, which has not been reached. In England a mill near Manchester has been working the ramie for two or three years. There are two companies in France and one in Belgium for promoting the cultivation of ramie.

Such is the brief outline of the present state of the ramie industry. It shows that the industry has become firmly established though its development is restricted by the lack of raw material.

SPOTTED NETS.

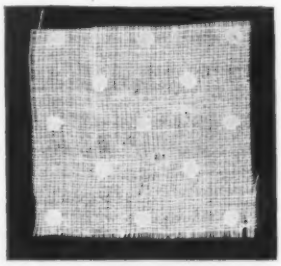
(By Our Special Correspondent.)

Embroidery and the processes that simulate embroidery are assuming a new importance to textile manufacturers. The sale of goods so decorated is larger than ever and apart from passing fashion there is some assurance that the fabrics are taking a permanent place. Low goods as well as fine are treated and in both the United States and Canada duty is being paid on fabrics elaborated abroad that might be imported plain and have their concluding processes applied by North American workpeople. The decoration worked upon goods finished in Europe is not usually done by the manufacturer of the cloth. It is performed at second hand and usually by some person who makes embroidery his special function. There seems to be no positive reason, however, why this class of finishing should not become a department in the mills producing goods suitable for treatment.

A very wide range of fabrics are now stitched in some manner for the market. Black dress goods of the voile, grenadine and crepe de chine families, and suitable particularly for making skirts, are perhaps submitted to the embroidery machines in the greatest numbers. Embroidered Irish and Scottish linens are in so much demand for the British, North American, Cuban and Australian markets that the supply can with difficulty keep pace with the demand. Cheap cotton muslins for blouses and for the hotter climates are fancy-stitched in very large quantities to the order of Manchester merchants. In Macclesfield quite an industry has arisen around the business of decorating

Japanese plain silks. To this may be added the trade in tamboured velvets and the spotting of waistcoatings, not to mention the embroidery of short lengths of Bolton cloths of Egyptian cotton and nets performed in Nottingham and in various continental centres.

The appetite for stitched goods is growing and it is well to see by what methods the consumption is met. In its simplest form the embroidery of dress goods takes the shape of a polka dot of silk. Owing to its superior brightness, artificial silk has come into very general use and to vary the more complex effects the threads are made to "shade" in different directions by running the stitches at different angles. That is accomplished by a superior type of embroidery machine. The elementary type is a sewing machine that forms spots one at a time. Under the control of the operator the needle descends,



DOTTED GOODS.

makes a certain number of stitches and comes to rest. The cloth has to be moved into position for each figure and a knot of stitches rather irregular in form and lumpy to the touch is made.

To make round flat dots, sprigs or fancy motifs a machine with a pantographic attachment, making several figures at one time, is needed for work of a regular kind. The hand embroidering machines of Adolph Saurer, Arbon (Switzerland), are used extensively in England and in Europe for continuous work upon piece goods and for the more elaborate stitching that is put horizontally upon short lengths of fabric. Detailed examination of so complex a machine is out of the question. It is driven by foot-power by an operator sitting before an enlarged draught of the design to be produced. Two rows of decoration 6 3/4 yards long may be produced by the 468 needles and their work is directed by the movement of the pantograph arm over the design. The machine is iron-framed, and supported to ensure rigidity. Ball bearings and cycle-chains are used to ensure ease of operation. Complete with mechanism for boring, the improved type of embroidery machine costs about $800 at Arbon station.

Obviously, the conditions are not identical in working piece goods and cut lengths horizontally suspended. Working longitudinally the repeat of the motif is unrestricted lengthwise. Between selvage and selvage the repeat is conditioned by the provision of needles and the distance from design to design must be 3 in., 2 ins., 1 in., 1/2 in. or 1/3 in. With these limitations it is claimed that the machines do anything that may be done by hand and something like them is necessary in doing real embroidery on a large scale.

It will have been noticed that there are cotton nets and kindred stuffs on the market that have the appearance of embroidery without having their designs either woven or stitched. Many of these have been used for lampshades, veilings and flimsy uses having elaborate designs. For dresses, nets with a small and very neat polka-dot are done and these are prepared usually under patents and with great secrecy by cloth-printers.

As to the general principle of their preparation there is no mystery. First, the goods are printed with an adhesive; they receive next, a dusting with short cotton fibre, are passed between rollers of appropriate tightness and are finally brushed to remove surplus down. The adaptations of the principle are the secrets that are guarded, but it may be doubted whether any considerable departure from this description is in use. Goods so dealt with have not the handle or the durability of those they imitate although they serve certain purposes. And by this means closer and smaller dots than can be woven or embroidered are obtained.

Upon gauzes, chiffons and the lightest fabrics a printing of beads of gelatine or gum is becoming more popular. While the effect does not imitate embroidery the means are

not unrelated to the process last-named. The object is to leave a bead of resinous matter in high relief upon the surface and this is accomplished by printing from a block furnished with tubes containing the necessary liquid.

These tubes or pens are dipped into a heated solution that will harden quickly on cooling, and they are impressed on cloth held in position by a stenter frame. A drawback to the operation is that the tubes, take up liquid on their outsides and this, congealing, tends to clog the pattern. With the idea of removing this defect an arrangement has been devised of whose working it would be premature to speak. In essential, there is a tank in two halves telescoping into each other, a cut-off perforated plate and a set of printing tubes. The action of the tank and of the air-valves fitted into it and the sliding cut-off plate is to supply the tubes with liquid from above. The drop congeals as it comes into contact with the fabric. The cloth moves forward and the action repeats. Control of the shape of the dot is effected by the shape of the tube used and large dots rather far apart are to be preferred as it must not be allowed to happen that the perforated plate opens other tubes in crossing over.

The utility of gelatine printing is confined to a rather narrow range of fabrics and possibly important modifications must be made in dealing with articles of different kinds. The number of gums and resins potentially useful is wide although some of them necessitate the use of alcohol or other inflammable solvents. The illusion has been entertained that it might be possible to dissolve cotton and to apply it to cloths in some manner and to reconstitute its fibrous appearance. Apparently, this shape can never be regained once it has been lost and attempts to print with cellulose result only in the deposit of blobs of gum. To lend novelty to liquid printing nothing seems more hopeful than attempts to vary the color of alternate spots or stars. At present the operation involves a heavy extra expense and as the utility of gum liquid printing is limited there is little incentive for more than a few firms to experiment in its direction.

A SMOKE TALK.

BY PAUL STANSFIELD.

There is nothing that pleases a young textile man more than to come across a group of old-timers in the business having a social smoke, and listen to their experiences as they tell them for the amusement of one another. I was in a small town not long ago where a new mill was being started, and on going into the parlor of the only hotel in the place found a few of the overseers spending the evening getting acquainted with each other. They had come from all over the country, and as I took in their conversation and studied over the make-up of each man, I became convinced that if good overseeing could make a mill a success, the future of the new enterprise looked as bright as could be.

As I joined them, they were warming up to the subject of the advantages and disadvantages of the long bobbin, and its effect in the spinning, spooling and weaving departments. Said a middle-aged robust looking chap, who proved to be a spinner that evidently knew his business: "There may be certain advantages to be gained by the use of the long bobbin the weaving room, but I can't see where much if anything is gained by its use in the spinning room. In spinning filling, about the only advantage I can think of is the less frequent doffing, and of course the same advantage is good on warp, but even this slight gain is lessened by the frequent breakages when the ring rail is at the bottom, the threads snapping more at this point owing to the increased tension caused by the longer traverse.

"On warp, there might be a much greater advantage than on filling, though this would depend on the sizes of yarns spun. For instance, a 7-inch traverse with a 2 1/8-inch ring would be all right on yarns ranging from 7s to 12s, but on 12s to 16s I should prefer a 2-inch ring. To spin from 16s to 20s, I should not want over a 6 1/2-inch traverse and a 1 7/8-inch ring, and from 20s to 30s I wouldn't have over a 6-inch traverse and a 1 3/4-inch ring. On yarns sizing from 30s to 45s a 5 1/2-inch or 5-inch traverse with a 1 5/8-inch ring would

be my limit, and even then I should expect trouble unless I watched my travelers pretty closely.

"There have been lots of new dodges tried in my day to increase the efficiency of spinning frames, but it doesn't take many breakages to offset the increased production obtained by most of them. But, on the spooler, I should say the conditions were entirely different, and that the long bobbin would be a saving there. I haven't figured it out, but as I think about it I should say that on 12s yarn, with a 7-inch bobbin and 2 1/8-inch ring, the spooling cost would be reduced about 50 per cent. as compared with a 6-inch traverse and 1 3/4-inch ring. Besides this saving in actual money, there would be the advantage of less knots in the yarn, and also the probability of there being less waste made on the bottoms of bobbins."

He paused here, partly for want of breath and partly to see what effect his remarks were having on his hearers, and before he could get started again the weaving room overseer, a young man from Maine, broke in by saying that he hardly knew what to think about the long bobbin from a weaver's standpoint. The heavier shuttle necessary would be harder on the loom, he thought, and undoubtedly cause the fixers more work; and if the bobbin wasn't free in the shuttle it would cause "saw-tooth edges," and considerable time would be lost in having to pick out. To be sure the weaver would have the comfort of less sucking in filling, but that seemed to him about all, as the extra troubles encountered would more than wipe out the benefit of having a bobbin last a longer time.

The same with the warp stop-motion. A mill might get better cloth through its use, especially in mills where they make stripes and the loss of a single thread would spoil the pattern, but the product would be less, and the weaver would be bothered by lots of little nuisances, such as kinks made in the warp room, which cause a wire to drop and stop the loom, and often take a great deal of time to discover. "I tell you," he added, "there is much that could be said as to the ins and outs of this question, and I am patiently waiting to see what the outcome of this general discussion that is going on all over the country will be."

"To change the subject," broke in the cloth room overseer, who hailed from Massachusetts, "what do you fellows think of this generally accepted idea that cloth gains in napping anywhere from 1 per cent. to 4 per cent. according to its construction? I have had this theory pounded into me ever since I knew what a cloth room was, and by men that were considered to be way up in the business, too, but I swear that from my experience I would rather believe that a loss was more likely to be found than a gain. It jars my nerves to hear people continually talking about gain in napping, because I can't make myself believe that there is any gain at all."

"I should think," said the weaver, "that there can't be very much gain, because the process of napping pulls out the filling, and even if the tension under which the cloth is run on the napper does have a tendency to stretch it, it seems likely that the contraction after it got on the trucks would more than offset any gain made from such a stretching."

"That's just my opinion," said the cloth room man, "and if anybody can give me any light on this subject I'd like to have it, as I firmly believe that cloth is more liable to lose in napping than gain, though I'll admit that there are many experienced mill men that would laugh at me and claim that the gain ought to pay for the cost of napping labor, as is the case with bleaching. Of course, some will say that the loss in width, which is generally supposed to be from 1 1/2 to 2 1/2 inches, goes toward making extra length, but I doubt it, and, as I said before, I would like some light on the subject if anybody is willing to give it."

"Speaking about the gain in finishing reminds me of a story once told me by a boss bleacher," said a tall and rather ugly looking fellow, who I learned later was the carder, "about an experience his concern had with a New York selling agent. It seems that the bleachery was run by a man of a very conscientious nature, who always insisted that every yard of cloth sent to be bleached should be shipped to the person

for whom it was intended, gain and all. It appears that the bleachery was receiving exactly the same kind of cloth from four different mills, all owned by one man, and after bleaching the cloth it was shipped to this selling agent in New York. As in all bleacheries, all lots were kept separate, and the cloth measured before leaving the works, and the lengths compared with those on the invoices from the shippers.

"Of course you all know that the gain in bleaching is generally supposed to be about 2 per cent., and that lots of concerns will bleach the goods for nothing if allowed to keep the gain. In this particular case, the cloth from three of the mills averaged to gain about the usual 2 per cent., but that from the fourth mill showed a gain of from 4 to 6 per cent. The foreman spoke to the manager about this extraordinary difference, and pointed out that as the product of the four mills was going to the same man, and the goods were identical in construction, it would not be wise to send all the gain made from the fourth mill, as the senders would be asking where all the gain from the other mills was going. On being assured that there was no mistake and that there did seem to be this unusual gain, the manager told the foreman not to mind the theories, and if the cloth gained so much it was the owner's good luck and he ought to have it. With that the subject dropped.

"The expected happened about a month after this conversation took place, when a letter was received from the selling agent comparing the different gains, and asking why if one lot gained so much the others couldn't do the same. Well, to cut my story short, this caused the whole matter to be investigated thoroughly, and after lots of trouble it was discovered that the mill was sending the bleachery more yards than they thought, through having the jaws of their measuring machines set 36 1/2 inches instead of 36, thus giving half an inch over on every yard. This experience," said the speaker, "goes to show that theories are all right to use as a basis for judging what might be, but when you find yourselves getting far away from those handed down through three or four generations, it is better to go slow and see if there is not a screw loose somewhere. That's why I incline a little to the thought that cloth must gain in napping, or the idea would have been proven a fallacy before now."

"I have come across some pretty tough propositions in my time," chimed in the spinner, "but of all my snags I think one that I got up against in a Southern denim mill was the worst ever. The first day I was on the job the superintendent sent for me to come to the cloth room, and when I got there I found him with the treasurer of the concern and also the head man of the selling house. All three were looking over some heavy denim cloth, and after being introduced they showed me a fault that they had been trying to remedy for months, so I was told later. I examined the cloth carefully, and came to the conclusion that the trouble was 'caterpillary' filling—that is, the filling was so chafed that when it got into the cloth it gave it a fuzzy effect like a caterpillar's back. Of course, in such cloth as denims, which are required to have a hard finish, this was a serious trouble, especially as the chafed filling appeared in numerous places throughout the pieces; and after a little lecture by the treasurer on the importance of correcting the evil, I went back to my room with some misgiving as to how long it would be before I should be looking for another place. However, I knew it was 'up to me,' so I set my thinking machinery to work.

"The thing that puzzled me most was why the defect should appear only in spots, and after a great deal of observation in my own rooms and in the weaving room, I discovered that the filling was chafed only at the bottoms of the bobbins. I had experienced this kind of trouble with filling to a less serious degree in other places, but had usually found the bad filling at the tops of bobbins instead of at the bottoms, in which case a change of travelers brought about the desired result. Every spinner knows that travelers will get worn into grooves, which will chafe a thread if not looked after, but this is generally caused by the extra tension on the threads when the ring rail is at the top, so that up to this time it was something new to

me to find the filling chafed at the bottom of the bobbins.

"With the knowledge that my travelers were not worn in any way, I began to experiment with the speed of the frames and the size of the travelers, and in this way I eventually got at the source of the trouble. It seemed that the excessive speed at which the frames were run, together with having a traveler that was too light, caused the threads to balloon too much when the ring rail was at the bottom and made them rub against the separators, thus chafing the filling considerably. Having located the trouble, the rest was easy. I tried putting on a heavier traveler at first without any great success, but after I had reduced the speed of the frames, leaving on the heavy traveler, 'caterpillar' filling was a thing of the past at that mill, at least while I was there. The superintendent told me later that the treasurer and selling house people were highly elated at having the fault corrected, but like all other officials they soon got over their elation, and it wasn't a great while before I found things getting disagreeable there and I accepted this job up North, where I think I shall stay."

"Speaking about feeling as though a job was as good as lost," spoke up the cloth room man after another cigar had been lit all round, "brings to my mind an experience I had when I had been at a mill down in Maine about eleven months. I was there on a year's trial, so you can understand how it bothered me to have something wrong come up at such a critical time. One morning the agent sent in a piece of cloth that had been returned by the parties to whom it had been shipped, with a note asking me to look it over and he would be in pretty soon to see me about it. I looked at the cloth, and at once made up my mind that I'd fire the second hand that let such a piece of cloth be put up and shipped, if I could satisfy myself that he had seen it. For it certainly was bad, and it disturbed me not a little to think that such a piece had gone out of my room.

"The agent came in just as I was looking over the last fold, bringing with him a sharp letter from the selling house, calling us down in great shape. I told the agent that I couldn't understand how such a piece could have gone out, but he didn't seem to like such a meagre answer a bit, and after he had left me I felt as though my job wasn't worth two cents to me after my year was over. In showing the cloth to the second hand later in the day, we came across a loose piece of tacking twine of a kind that had never been used there in my time, and this set me to thinking that perhaps the cloth was not ours after all, and yet the count, width and weight agreed with what we were putting up exactly.

"However, I couldn't rest to let the matter end there, so later in the afternoon I mustered up courage enough to mention my suspicions to the agent, telling him about the strange piece of tacking twine, and asking him if it were not possible for somebody else's cloth to have got mixed in with ours somewhere. He said he guessed not, and gave me scant encouragement, but you can imagine my delight when a few days later he told me with a smile that they had looked the matter up and found that it wasn't our cloth at all, but had been made at a branch mill in another city. You can just bet I felt relieved to hear this, and instead of being fired at the end of my year, I was engaged for good at a substantial increase in my salary. From that time until now I have always made it a point to use a tacking twine that I was positive no other mill used, as had it not been for the difference between the twine used at those two mills, I feel sure I should not have been there as long as I was."

The spinner was about to relate another yarn about his troubles with Portuguese and Greek help, but the cloth room man said he was going to bed, as he had smoked enough for one night, and they could meet again later on. The rest agreed, but I was sorry to hear the discussion end, and made up my mind to look them up again next time I was in that neighborhood, feeling that it had been time profitably spent.

Fifty per cent. of the imports of cotton goods into Manchuria last year came from the United States. In the one item of sheeting the sales aggregated $5,677,805.

REMEDIES FOR IMPERFECTIONS IN WOOLEN CARDING.

BY HENRY ALLMAN.

In discussing this subject it is not my intention to set forth never-failing rules, but to give an outline of such imperfections as have turned up from time to time in my experience and the methods I have used to overcome them. This may help some one else out of his troubles, or be of sufficient interest to induce him to give us his opinion of them.

Uneven roving is very frequent in some card rooms. A lot of trouble is sometimes caused by the Bramwell feeds not working properly, or where there is a difference in the ends of the spools from an improperly working Apperly feed on the finisher. I have a board fastened between the frames of my Bramwells in front of the doffing or stripping apron placed so that when the stock is delivered from the doffing apron, instead of striking the outside wing of the scale, it strikes the board and falls directly in the centre of the scale, which with the spike and doffing apron coupled together with gears make a positive weighing at all times. A good feed must be laid on the feed apron, that is, it must be heavy enough, but not so heavy as to fall back on the apron after the push board releases it to make way for the next weighing. Neither should it be so light that there will be bare places on the apron. I have seen them running like this and the carder would sing the praises of the creel for making even work.

Next be sure that the draft between the feed aprons and the feed rollers is right. There should be no pulling apart between the apron and the feed rollers, or any bunching up in front of the feed rollers. Another cause for a lot of unevenness on the first breaker, or rather Bramwell, is the set of the dog that engages with the clutch of the spike apron. This dog should be set not more than one-half an inch from the clutch and even closer, in fact, just so it will be sure to clear the clutch. The reason for this is that if it is set much farther off, it will when it is released by the scale, jump several teeth at times before it throws the clutch out; at other times it will catch at once, thereby making uneven weighing and consequently uneven roving.

The finisher Apperly can also be a source of unevenness. I make it a rule to have the second breaker side drawing as soft and fine as the stock will stand. At present I am running from 60 per cent. to 85 per cent. of shoddy stock and in most cases I use no twist at all; this lays a compact soft bed on the finisher Apperly. The second breaker doffer should be run at a good speed, at the same time the speed of the side shaft should be reduced so as to keep the feed rollers at the same speed as before. This holds good on the first breaker as well. This will give a light side drawing, a lighter load on the card and better work. The drawing should not be twisted hard. If it is, it only undoes what the preceding card has done, besides being injurious to the feed rollers, leader and all the rest of the card. The tension on the drawing should be the same on one side of the Apperly as the other. As the web is laid on the Apperly so it should go direct to the feed rollers with a slight retention on the extreme end of the wide side and a slight advance on the extreme end of the narrow side. The feed should be packed as closely as possible without bulging; this will make the feed as near like a continuous sheet as it is possible to make it on an Apperly feed and the chances for coarse ends or unevenness in the weighings from the ends of the spools are greatly reduced.

The cotton spinning industry of Japan is now the most important branch of manufacture in the Empire, according to a recent report from that country. This report states that there are 49 spinning mills in existence throughout the country, and that the number of spindles aggregates 1,330,234. The factory hands employed number 71,445, and their average pay is about twenty-five cents a day.

It is estimated that the consumption of cotton increases at the rate of 400,000 bales a year.

TEXTILE PROCESSES.

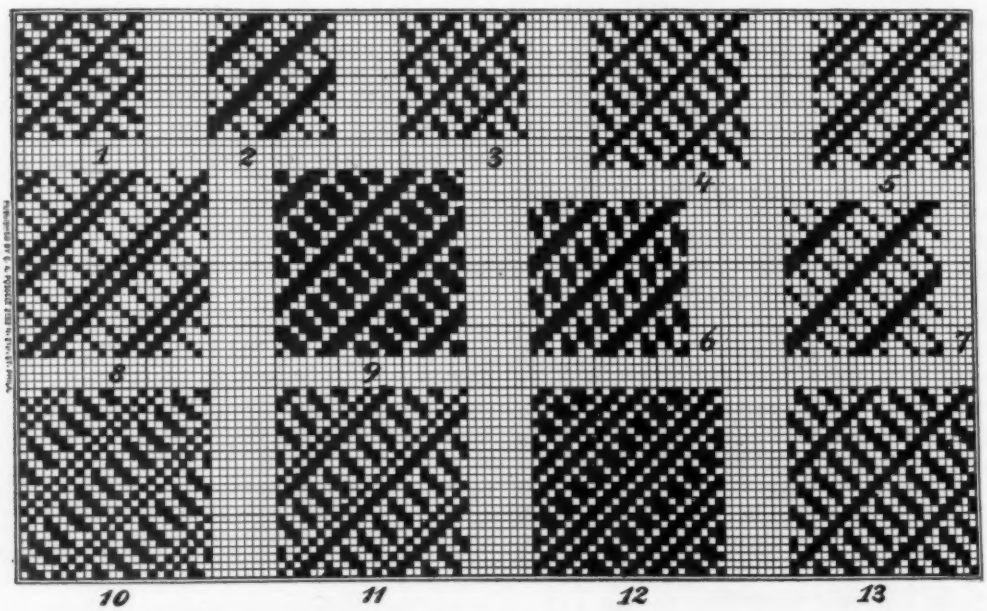
EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

FANCY TWILLS HAVING DOUBLE TWILL EFFECTS.

These twills are used very extensively in the manufacture of fancy worsted suitings, as well as fancy dress goods. More particularly are they becoming fashionable now in connection with the former class of textiles.

For example, let us consider weave Fig. 1 and



For constructing these weaves no special rule can be laid down. However, a thorough explanation of the four plates of weaves accompanying this lesson will be sure to give the desired information to the student, showing him at the same time how to construct an endless variety of these weaves for his special use.

Provided we insist upon a rule for designing these weaves, the best plan of how to proceed is thus:

First, run your main twill line from left to right, after which reproduce a repeat of this twill line, inserting then between these twill lines, pieces of twills running in the reverse direction of the main twill, i. e., from right to left, being careful at the same time to make the best possible connection between these pieces of twill lines running from right to left and the main twill lines running from left to right (or vice versa) in order to produce a clear break at the place where these two twill effects meet.

where the main twill line is produced by means of the $\frac{2}{6}$ 8 harness 45° twill running from left to right, after which we introduce pieces of the $\frac{2}{3\,4}$ harness twill running from right to left, the complete weave repeating on 8 x 8.

Weave Fig. 2 is another 8 harness fancy twill, showing a double twill effect, using in this instance the $\frac{2}{5}$ 8 harness 45° twill for the main twill, running in the direction from left to right, the double twill effect being produced by means of inserting pieces of the $\frac{1}{3}$ 4 harness twill to run in the reverse direction.

Weave Fig. 3 has for its foundation twill the

same two twills as used in connection with weave Fig. 1, with the difference that the position of the twill pieces, considering both twills, (Fig. 1 and Fig. 3) is changed, i. e., reversed.

Weave Fig. 4 has for its main twill the $\frac{2}{5}$ 10 harness 45° twill, using for the double twill effect pieces of the $\frac{2}{2}$ 4 harness twill, the complete weave repeating on 10 x 10.

Weave Fig. 5 shows the combination of the $\frac{2_1 2_5}{}$ 10 harness 45° twill for main twill combined with the $\frac{1}{3}$ 4 harness twill for the double twill effect, the fancy diagonal repeating on 10 x 10.

Weave Fig. 6 has for its foundation the $\frac{2}{7}$ 10 harness 45° twill for the main twill, running from left to right, being in turn crossed with the pieces of $\frac{2}{1}$ 4 harness twill for the double twill effect; repeat of weave 10 x 10.

Weave Fig. 7 in the same manner shows the combination of the $\frac{2}{7}$ for main twill, being crossed with pieces of the $\frac{1}{3}$ 4 harness twill for double twill effect; repeat of complete weave 10 x 10.

Weaves Figs. 8, 9, 10, 11, 12 and 13 show us six neat little effects of this class of fancy double twills repeating on 12 x 12, the combination of weaves used being thus.:

Fig. 8 $\frac{2_1 2_7}{}$ 12 harness twill / and $\frac{1}{3}$ 4 harness twill pieces.

Fig. 9 $\frac{3}{5}$ 12 harness twill / and $\frac{2}{1}$ 4 harness twill pieces.

Fig. 10 $\frac{1_1 1_5}{}$ 12 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Fig. 11 $\frac{1_1 2_5}{}$ 12 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Fig. 12 $\frac{2_1 2_7}{}$ 12 harness twill / and $\frac{2}{1}$ 4 harness twill pieces.

Fig. 13 $\frac{2}{10}$ 12 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Weave Fig. 14 to 19 give us a collection of six excellent fancy twills for a double twill effect, repeating on 16 harnesses and 16 picks, the same having for their foundation:

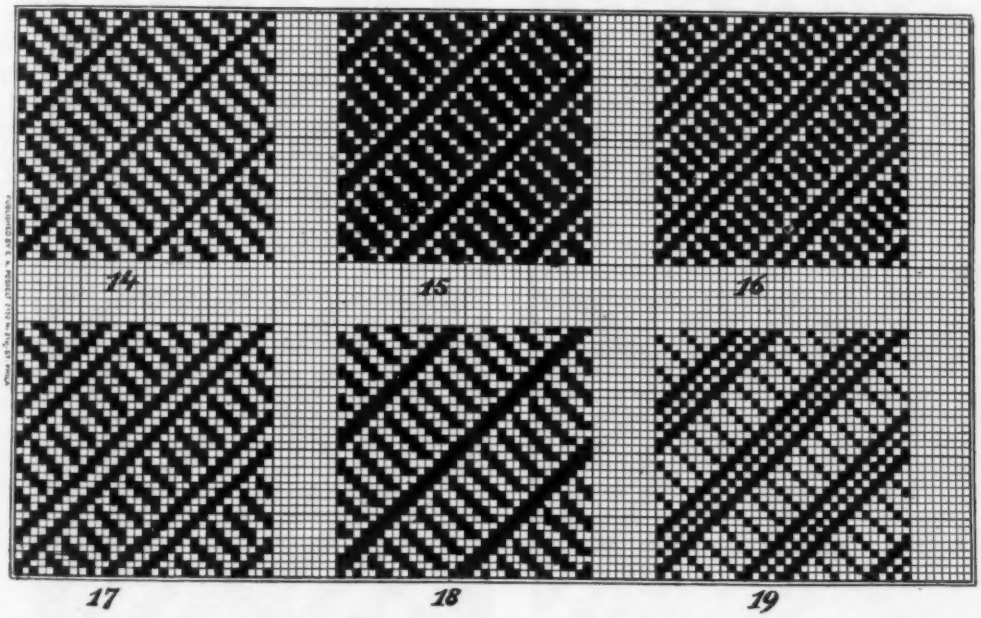


Fig. 14 $\frac{2}{14}$ 16 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Fig. 15 $\frac{2}{13}$ 16 harness twill / and $\frac{2}{1}$ 4 harness twill pieces.

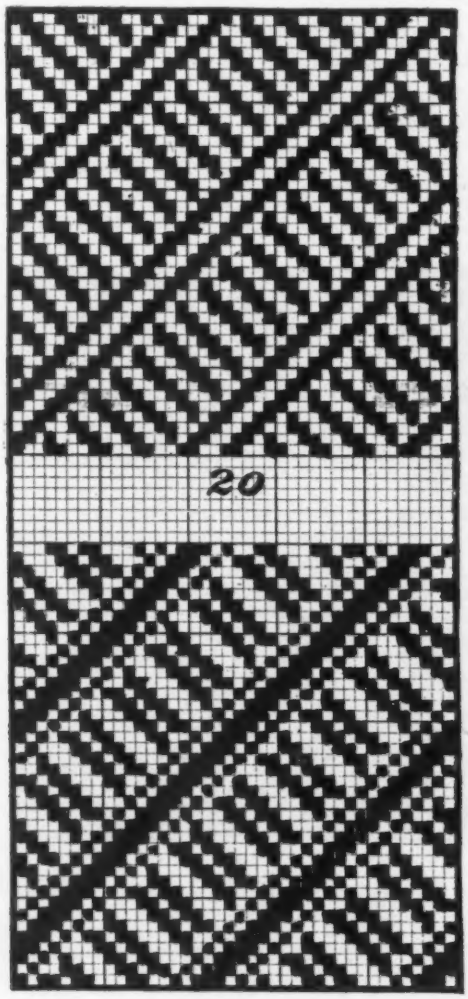
Fig. 16 $\frac{2_1 2_{11}}{}$ 16 harness twill / and $\frac{2}{1}$ 4 harness twill pieces.

Fig. 17 $\frac{2_3 2_{10}}{}$ 16 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Fig. 18 $\frac{2}{13}$ 16 harness twill / and $\frac{2}{3}$ 4 harness twill pieces.

Fig. 19 $^{2}_{1}{}^{1}_{1}{}^{2}_{3}$ 16 harness twill / $^{1}_{3}$ 4 harness twill pieces.

Weaves Figs. 20 and 21 show us two examples of the present system of weaves repeating on 20 harness and 20 picks.



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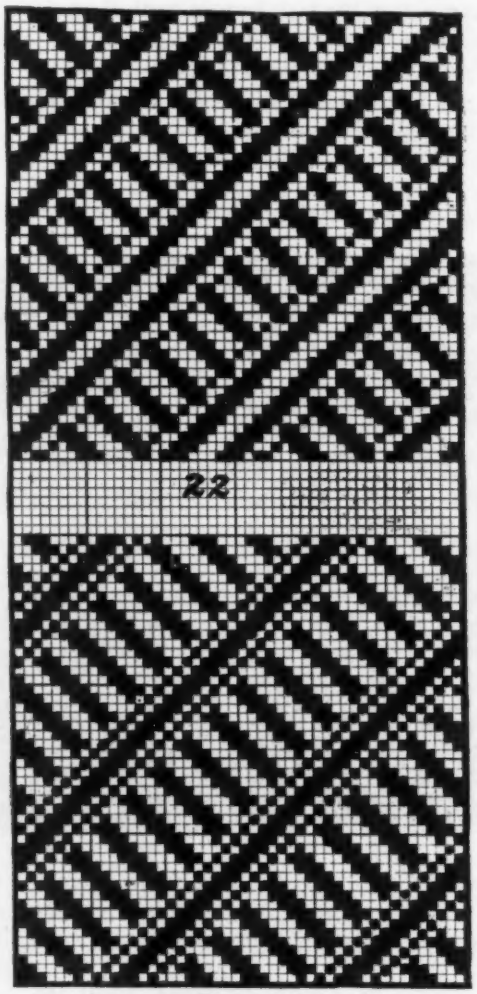
Weave Fig. 20 having for its main twill as running from left to right the $^{2}_{3}{}^{2}_{13}$ 20 harness 45° twill and in connection with which we used pieces of the $^{2}_{3}$ 4 harness twill for the double twill effect.

Weave Fig. 21 shows the combination of the $^{1}_{1}{}^{3}_{1}{}^{1}_{13}$ 20 harness 45° twill for the main twill effect, with pieces of the $^{2}_{1}{}^{2}_{3}$ 8 harness 45° twill used for the double twill effect.

Weaves Figs. 22 and 23 are two 24 harness fancy twills of the present system, Fig. 22 having for its foundation the $^{3}_{3}{}^{3}_{13}$ 24 harness and



23

the $^{3}_{3}$ 6 harness 45° twills, one additional spot (riser) being used in connection with the latter so as to cut off an extra long filling float of "4 up" caused by ending the twill pieces with a pointed end (see the next weave and where these twill pieces are ended in a regular way).

Weave Fig. 23 has for its main twill, as running from left to right hand, the $\frac{1}{1}\frac{3}{1}\frac{1}{17}$ 24 harness regular twill and the $\frac{2}{3}$ 6 harness 45° twill. Repeat of both weaves, Figs. 22 and 23 is 24 x 24.

WORSTED YARNS.

It will now be in its proper place to give a description as to the grading of worsted yarns, the standard of which is 560 yards, the number of hanks that balance one pound indicating the number of the count by which it is graded. Consequently if 30 hanks each 560 yards long, weigh one pound, i. e., 30 × 560 = 16,800 yds. weigh one pound, such yarn is then known as single 30s worsted.

If 60 hanks or 33,600 yds. of worsted yarn are required to balance one pound, such yarn then is known as single 60s worsted.

In this way the number of yards for any size or count of single worsted yarn is found by simply multiplying the number of count with 560.

Worsted yarn, as mentioned before, is frequently produced in 2-ply, in which instance only one-half the number of yards as required per pound for the single yarn are necessary to balance a pound of 2-ply yarn, and when consequently 2-ply 30s worsted, technically written 2/30s worsted, requires 30 ÷ 2 = 15 × 560 = 8,400 yds. to balance one pound.

In the same manner, 2/60s worsted yarn requires 60 ÷ 2 = 30 × 560 = 16,800 yds. to balance one pound.

If the yarn be more than 2-ply, divide the number of yards of the single yarn by the number of the ply.

For example, 3/90s worsted yarn = 90 ÷ 3 = 30 × 560 = 16,800 yds. required to balance one pound.

To ascertain the weight in ounces for a given number of yards of worsted yarn of a known count, multiply the given yards by 16, and divide the result by the number of yards the given count of worsted yarn contains, balancing one pound.

For example (single yarn). Ascertain the weight of 12,600 yds. of 40s worsted.

12,600 × 16 = 201,600, and

1 lb. of 40s worsted = 22,400 yds., thus:

201,600 ÷ 22,400 = 9 oz. Ans.

Another example (2-ply yarn). Find the weight of 12,600 yds. of 2/40s worsted.

12,600 × 16 = 201,600, and

1 lb. of 2/40s = 11,200 yds.

Hence 201,600 ÷ 11,200 = 18 oz. Ans.

A third example (3-ply yarn). Find the weight of 12,600 yds. of 3/40s worsted.

12,600 × 16 = 201,600, and

1 lb. of 3/40s = 7,466 2/3 yds., thus

201,600 ÷ 7,466 2/3 = 27 oz. Ans.

Another rule for ascertaining the weight in ounces for a given number of yards of worsted yarn of a known count is as follows:

Divide the given yards by the number of yards of the known count required to balance 1 oz.

(1) Example (single yarn). Find the weight for 12,600 yds. of 40s worsted.

22,400 ÷ 16 = 1,400, and

12,600 ÷ 1,400 = 9 oz. Ans.

(2) Example (2-ply yarn). Find the weight of 12,600 yds. of 2/40s worsted.

11,200 ÷ 16 = 700, and

12,600 ÷ 700 = 18 oz. Ans.

(3) Example (3-ply yarns). Find the weight of 12,600 yds. of 3/40s worsted.

7,466 2/3 ÷ 16 = 466 2/3, and

12,600 ÷ 466 2/3 = 27 oz. Ans.

To ascertain the weight in pounds of a given number of yards of worsted yarn of a known count, divide the given yards by the number of yards of the known count required to balance one pound.

(1) Example (single yarn). Find the weight of 1,260,000 yds. of 40s worsted yarn.

40s worsted = 22,400 yds. to 1 lb., thus

1,260,000 ÷ 22,400 = 56 1/4 lbs. Ans.

(2) Example (2-ply yarn). Find the weight of 1,260,000 yds. of 2/40s yarn.

2/40s worsted = 11,200 yds. to 1 lb., thus

1,260,000 ÷ 11,200 = 112 1/2 lbs. Ans.

(3) Example (3-ply yarn). Find the weight of 1,260,000 yds. of 3/40s worsted yarn.

3/40s worsted = 7,467 yds. to 1 lb., hence

1,260,000 ÷ 7,467 = 168 3/4 lbs. Ans.

Worsted yarn is also occasionally manufactured in 2, 3 or more ply yarn, in which the minor threads are of unequal counts.

If the compound thread is composed of two minor threads of unequal counts, divide the

product of the counts of the minor threads by their sum.

For example. Find the equal in single yarn to a 2-fold thread composed of single 20s and 60s.

$20 \times 60 = 1{,}200$, and

$1{,}200 \div 80\ (20 + 60) = 15$s. Ans.

If the compound thread is composed of 3 minor threads of unequal counts, compound any two of the minor threads into one, and apply the rule given previously to this thread and the third minor thread not previously used.

For example. Find equal counts in a single thread to a 3-ply yarn composed of 20s, 40s and 60s.

$20 \times 40 = 800$

$800 \div 60\ (20 + 40) = 13\ 1/3$

$13\ 1/3 \times 60 = 800 \div 73\ 1/3\ (13\ 1/3 + 60) = 10\ 10/11$s. Ans.

These examples can be proved by the second rule, viz.:

Divide one of the counts by itself and by the others in succession, and after this by the sum of the quotients.

For example. Find equal counts in a single thread to a 3-ply yarn composed of 60s, 40s and 20 worsted.

$60 \div 60 = 1$

$60 \div 40 = 1\ 1/2$

$60 \div 20 = 3$

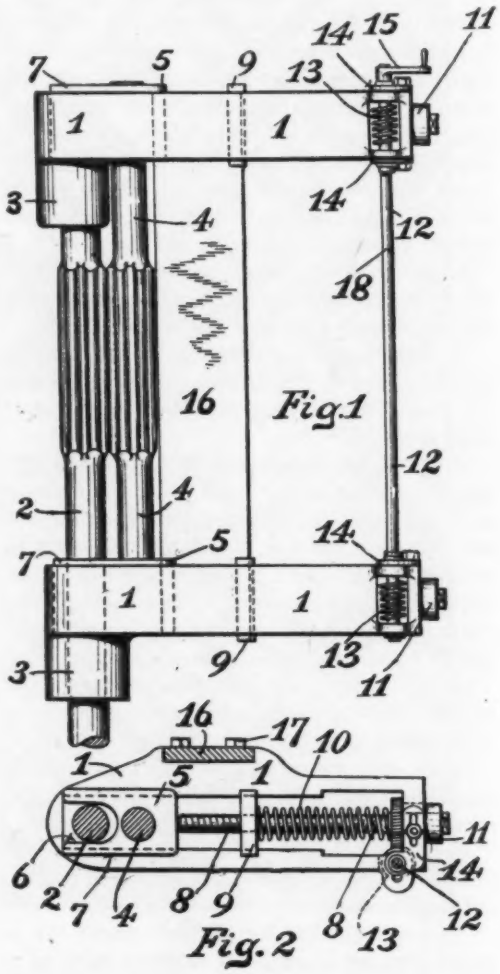
$5\ 1/2$

$60 \div 5\ 1/2 = 10\ 10/11$s. Ans.

AN ENGLISH IMPROVEMENT TO WOOL-COMBS, GILL-BOXES, ETC.

The object of this improvement is to provide means for mounting the fluted rollers in Noble combs, gill-boxes, etc., for the purpose of adjusting these rolls nearer to, or farther apart from each other, either together or separately, at the same time enabling the side frames, or top frames supporting the bearings for the rollers, to be readily removed without in any way changing the adjustment of the various parts when they are assembled together again. The new arrangements also allow the usual leather aprons passing around the rollers to be easily removed and renewed, besides preventing any undue wear on the aprons, the fibres, in connection with the gill-boxes being drawn in an even manner across the full width of the sliver as it leaves the combing-fallers.

With reference to the illustrations accompanying this article, Fig. 1 shows a side elevation of a pair of fluted drawing rolls of a



Noble comb, the new arrangement for adjusting the rolls being also shown. Fig. 2 is a plan view of Fig. 1.

In the illustrations, 1 represents bearing-brackets attached in the ordinary way to the comb, said brackets being made with a fixed bearing in the ends in line with the main body of brackets and consequently the bear-

ing-blocks for the movable fluted roller have to be made very thin at the side nearest to the roller in the fixed bearing, with the consequent disadvantage that the draft of the wool, in passing between the rollers, has a tendency to pull the bearings out of alignment by wearing elongated holes in them, so that the flutes or grooves of the rollers instead of remaining parallel to each other, as required for good work, will be pulled out of alignment with each other, thereby tending to cut and destroy the drawing-off leathers, as the pressure upon the latter is unequal. With this arrangement it is impossible to give the bearing-blocks sufficient bearing-surface to resist the tendency to wear, and for which reason the roller 2 is carried in bearings 3, formed on the under side of the brackets 1. The bearings for the second fluted roller 4 are loose, as at 5, and are thus capable of sliding over the bearings 3, to permit the flutes of the rollers to be brought quite close together. As seen from illustration Fig. 2 the lower bearings are provided with fork shaped extension-pieces 6, which pass around roller 2, being kept in vertical position by means of flanges 7 resting on brackets 1, the extension-pieces 6 entirely preventing the roller 4 from getting out of parallelism with the roller 2.

For adjusting the rollers 2 and 4 simultaneously to and from each other, screwed rods 8 are provided, and which bear against the back of the bearings 5, and pass in turn through slidable nuts 9, as usual; springs 10, surrounding the rods 8, thereby bringing pressure to bear on the nuts.

At the outer ends, the rods 8 are made square and pass through a flanged bushing 11, which is turned on its exterior to fit a hole formed in the end of each bracket 1. The squared ends of each rod extend somewhat beyond the outer ends of the bushes for the purpose of putting pressure upon the springs 4.

When proper adjustment has been made the bushes can be locked in position by set-screws; the rods 8 being free to have longitudinal movement through the bushes in accordance with the thickness of wool or other fibers passing between the rollers.

In order to adjust both rods 8 at the same time, a light shaft 12 is provided, capable of being readily connected and disconnected by the means to be described later. This shaft is provided with worms 13 and is journaled in bearing-brackets 14, capable of being secured to and adjusted on the brackets 1 by means of set-screws or the like. The shaft 12 is rotated by a winch handle 15. 16 indicates a cross-rail for connecting the two bearing-brackets 1, together, being secured to the brackets 1 by set screws 17, so as to enable it to be readily disengaged from the top bearing-bracket, 1.

As mentioned before, the shaft 12 is capable of connection and disconnection, this being accomplished by slotting one part of the shaft and cutting away the other portion as at 18, or by cutting a number of slots and corresponding portions to fit into them, thus forming a claw-coupling.

By this arrangement of the shaft 12, in the manner indicated, one portion of it can be turned, after being disconnected, so as to advance or withdraw the corresponding screw 8, thereby enabling each bearing to be adjusted separately, if required, and yet giving facility for adjusting both bearings simultaneously when the parts are connected together.

A NEW WARP TENSION DEVICE.

The object aimed at by this warp tension is to provide an additional brake mechanism to the regular tension device (conditional let off) of a loom, in order to be able to introduce more picks per inch into the cloth weaving, with the consequent result of a stiffer fabric being produced. Said brake mechanism is thrown in action, i. e., made to increase the resistance to movement of the warp beam at the movement when the lay beats up the filling, being in turn thrown out of action, i. e., relieving the warp beam of this resistance when the filling has been introduced, i. e., beaten up by the reed, up to the fell of the cloth.

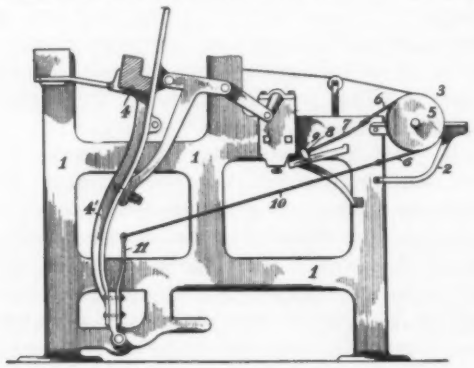
In order to be able to more clearly explain to the reader the construction and operation of this warp tension, the accompanying illustration, showing the new attachment and

those parts of a loom to which the same more particularly refers, is given.

In said illustration, 1 indicates a portion of a loom frame, having mounted thereon in brackets, 2, the warp beam, 3. The lay of the loom is indicated by 4, and the lay sword 4′.

With reference to the warp beam, 3, the same is provided with a pulley at each of its ends, said pulleys being grooved for the reception of the usual weighted rope or tension cord, i. e., conditional take up (not shown).

The New Brake Device.—Upon one end of the warp beam is mounted a brake pulley, 5, with which a brake band, 6, co-operates, and which has connected to one of its ends a rod,



7, the end of which is threaded to receive nuts, 8, by means of which one end of the brake band, 6, is adjustably connected to a bracket, 9, on the loom frame.

The other end of the brake band has a rod, 10, connected with it, the end of which is attached to an arm, 11, fastened to the lay sword, 4′, it moving to and fro with the lay sword, thereby alternately applying and releasing the brake band, 6, from its brake pulley, 5, as the lay oscillates during the operation of the loom.

The arm, 11, is made of metal and of such a construction as to be somewhat yielding, thereby affording a gradual gripping and releasing of the brake band, 6, on brake pulley, 5.

Having given a description of the various parts operating in connection with the new tension device, it will be readily seen that whenever the lay moves forward, that is, beating up the filling, at the same time the arm, 11, and rod, 10, pull on the brake band and by means of frictional contact thus produced prevent any movement of the warp beam, in this manner making it possible for the insertion of more picks per inch, resulting in turn in the production of a stiffer fabric.

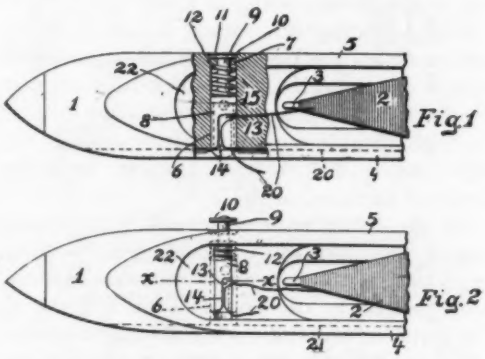
AN IMPROVED SELF THREADING SHUTTLE.

The gist of the improvement consists of an endwise movable spring pressed slotting tube or threading eye mounted transversely in the front end portion of the shuttle, as well as means for temporarily locking the eye member in the retracted position while the filling is inserted therein; the general arrangement being such that upon the releasing the then threaded eye, the force of a spring automatically advances the eye and delivers its thread through the front side of the shuttle.

The construction of this shuttle is shown in connection with the accompanying six illustrations, and of which—

Fig. 1 is a top or plan view, partially in horizontal section, of the forward end portion of an ordinary loom shuttle, with the new self-threading shuttle device attached thereto.

Fig. 2 is a similar plan view showing the



device in the locked or open position for receiving the filling thread.

Fig. 3 is an inverted plan view of Fig. 2.

Fig. 4 is a longitudinal sectional view taken on line x——x of Fig. 2.

Fig. 5 is a plan view of the threading number shown separate from the shuttle, being a slightly modified form, and Fig. 6 is an end view thereof.

With reference to numerals of reference accompanying the illustrations, the same indicate thus: 1 shows the forward portion of the shuttle, having mounted in it as usual the cop 2 and spindle 3. At the point where the threading eye is usually located the shuttle is bored transversely from the front side, 4, to the rear side, 5, thereby producing a hole, 6, which has an abutment or partition, 7, at its rear end. Into the hole, 6, is movably fitted a spring pressed tube or eye member, 8, which has a central shank or rearward extension, 9, passing freely through the partition, 7, and

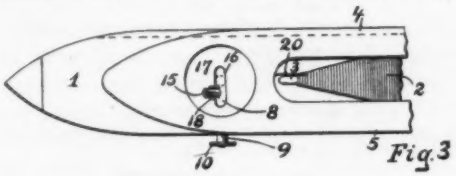


Fig. 3

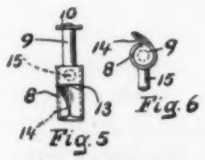


Fig. 5 Fig. 6

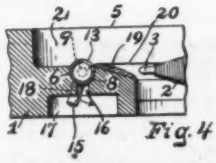


Fig. 4

which is fitted with a flange, 10, this flange, when the shuttle is in normal action, lying in a recess, 11, formed in the rear side of the shuttle. In the space formed between the rear end of the member, 8, and partition, 7, and surrounding the shank, 9, a helical coiled spring, 12, is mounted, the purpose of the latter being to keep the eye member, 8, normally closed, the eye member, 8, being at the same time limited in its forward movement on account of flange, 10, coming into contact with the exterior face of partition, 7. The shape of the eye member, 8, is tubular, it having a short traverse peripheral opening, 13, cut through its wall, the same being in direct open communication with a narrow, longitudinal opening, 14, extending from the front end of the tube.

It will be readily seen by referring to Fig. 4, that the body or material of the shuttle extends somewhat above the centre of the member, 8, its purpose being to maintain the latter in position in the hole, 6, in this way only a portion of the eye member, 8, being exposed.

Upon the under side of this eye member, 8, a short pin or latch, 15, is provided, which passes downwardly through a slotted opening, 16, formed transversely in the base of the shuttle, the later being recessed on its under side, as at 17. The object of this latch is to lock or hold the eye member, 8, in the open position while it is being threaded.

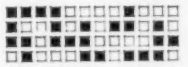
The locking or holding of the eye member, 8, is effected by means of a notch, 18, into which the pin, 15, is swung, after first pressing the eye member, 8, rearwardly, the action being somewhat similar to that of an ordinary door bolt.

The shuttle is also provided with an ordinary tension device, 19, consisting of a piece of felt, and over which the yarn, 20, after leaving the cop, 2, passes in its travel through and out of the shuttle.

The manner in which the shuttle is threaded is as follows: After having placed the cop, 2, upon spindle, 3, in the usual way, the eye member, 8, being in the open and locked position, as shown in Figs. 2, 3 and 4, the end of the yarn, 20, as coming from the cop is taken and a loop or bend formed with said free end, which then is placed in the slotted opening, 13 and 14, as shown in Fig. 2. Next the latch, 15, is pressed in the direction of arrow (see Fig. 4) thereby releasing it from the notch, 18, in turn swinging the eye member, 8, a corresponding angular distance, while at the same time the spring, 12, quickly forces said eye member, 8, endwise, until the flange, 10, comes in contact with partition, 7. This latter movement carries the front end of the eye member, 8, as carrying the yarn, forward, through to the front side of the shuttle, and into the longitudinal groove, 21, in turn closing the eye member, 8, from the upper recessed portion, 22, the threading of the shuttle being thus completed.

FOREIGN NOVELTIES.

Worsted Trousering.



Complete Weave.

Repeat 12×4.

Warp—4800 ends, 12 harness straight draw.

Reed—19×4=63½ inches wide in loom.

Dress—

1 end, 2/30s worsted, gray.
2 ends, 2/30s worsted, black.

3 ends in repeat of pattern.

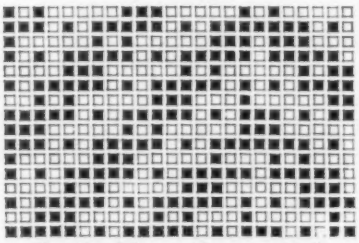
Filling: 75 picks per inch, arranged thus:

1 pick, 2/30s worsted, gray.
3 picks, 2/30s worsted, black.

4 picks in repeat of pattern.

Finish—Clear, worsted finish; 56 inches wide.

Worsted Trousering.



Complete Weave. Repeat 24×16.

Warp—7520 ends, all 2/60s worsted, 24 harness straight draw

Reed—14½×8=65 inches wide in loom.

Dress—

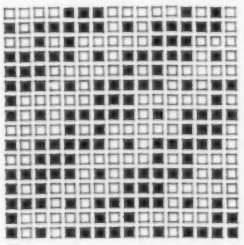
2 ends, light pearl.
2 ends, black.
2 ends, light pearl.
4 ends, black.
6 ends, medium gray
8 ends, black.

24 ends repeat of pattern.

Filling:—140 picks per inch, all 2/60s worsted, black.

Finish—Clear, worsted finish; 56 inches wide.

Worsted Melton.



Complete Weave.
Repeat 16×16.

Warp—7140 ends, 16 harness straight draw, all 2/48s worsted yarn.

Reed—17½×6=68 inches wide.

Dress—

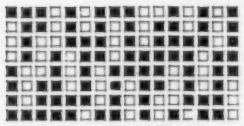
2 ends, white.
6 ends, black.
2 ends, white.
2 ends, black.
2 ends, black and white twist.
2 ends, black.
2 ends, white.
4 ends, black and white twist.
2 ends, white.
2 ends, black.
2 ends, black and white twist.
2 ends, black.
2 ends, white.
4 ends, black and white twist.
2 ends, white.
2 ends, black.
2 ends, black and white twist.
2 ends, black.

44 ends repeat of pattern.

Filling—100 picks per inch, all 2/48s worsted, black.

Finish:—Worsted melton finish: scour well, full and clip on shear; 56 inches finished width.

Union Trousering.



Complete Weave.
Repeat 16×8.

Warp—5670 ends, 16 harness, straight draw, all yarn, 2/32s worsted.

Reed—15×6=63″ wide in loom.

Dress—

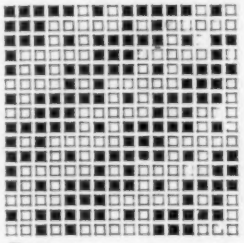
2 ends, dark blue.
1 end, lavender.
1 end, black.
1 end, lavender.
5 ends, black.
1 end, lavender.
1 end, black.
1 end, lavender.
2 ends, dark blue.
9 ends, black.

24 ends repeat of pattern.

Filling—60 picks per inch, all 5 run, black woolen yarn.

Finish—56 inches finished width.

Worsted Suiting.



Complete Weave.
Repeat 16×16.

Warp—6520 ends, 16 harness straight draw.

Reed—12½×8=64⅛ inches wide in loom.

Dress—

1 end, 2/72s worsted black, twisted with 2/60s white mercerized cotton.....=1 } × 2= 8 ends
3 ends, 2/60s worsted, black.....=3 }
2 ends, 2/60s worsted, gray.....=3 } × 6= 24 ends
2 ends, 2/60s worsted, black.....=2 }

Repeat of pattern: 32 ends

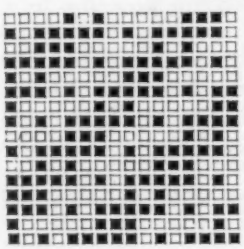
Filling—120 picks per inch, arranged thus:

2 picks, 2/60s, worsted, gray.....=2 } × 2= 8 picks
2 picks, 2/60s, worsted, black.....=2 }
2 picks, 2/60s, worsted, black and gray.....=2 } × 10=40 picks
2 picks, 2/60s, worsted, black.....=2 }

Repeat of pattern: 48 picks

Finish—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 16×16.

Warp—7952 ends, all 2/48s worsted.

Reed—15½×8=64″ wide in loom.

Dress—

2 ends, black and white twist	× 3=12	
2 ends, dark gray	× 3=12	×7 =168 ends
2 ends, black	× 3=12	
2 ends, dark gray	× 3=12	
2 ends, black and white twist	× 3=	12 ends
2 ends, dark gray	× 3=	12 ends
2 ends, black	× 2=	8 ends
2 ends, dark gray	× 2=	8 ends
2 ends, black	=	2 ends
2 ends, Scotch green	=	2 ends
Repeat of pattern:		192 ends

Filling—120 picks per inch; same arrangement; colors and counts of yarn as is used for warp.

Finish—Clear worsted finish; 56 inches wide.

HUMIDIFIERS AND VENTILATORS WITH REFERENCE TO COTTON SPINNING.

The advantages claimed for humidifying the atmosphere in a cotton spinning mill are: Increased production for a given plant of machinery, and on certain bad days of the year, a good deal can be said in favor of thus preparing the atmosphere for perfect work.

A very dry atmosphere has a tendency to make the fibres rough and brittle, whereas the tendency of a humid atmosphere is to make the fibres of cotton soft, flexible and smooth, and to lay down a good many of the fibres which usually project loosely from the body of the sliver, slubbing, roving or thread.

A warm humid atmosphere is the best possible kind for the good spinning of cotton. In a cold atmosphere, the oil in the fibres becomes partly solidified, and makes the cotton liable to stick to the rollers, etc. A somewhat high temperature liquefies this oily substance and reduces its viscour or sticky properties.

Although there are differences of opinion as to the proper temperature for cotton spinning, from 70° to 90° F. is the usual temperature, and while some spinners on coarse yarns are satisfied with 70° to 75° F., some spinners of fine counts may stop at nothing short of 95° to 100° F., but which may be considered quite unnecessary if proper attention is paid to humidification.

The most reliable analysis of American cotton is as follows:

Cellulose	83.71 per cent.
Water	6.74 per cent.
Nitrogen—free extract	5.79 per cent.
Ash	1.65 per cent.
Protein	1.50 per cent.
Fat	0.61 per cent.
	100.00 per cent.,

and from which it will be seen that a certain amount of moisture (water=6.74%) technically known as water of hydration is present in raw cotton, a feature in favor of every one of the processes comprised by the word cotton spinning, but we must remember that in a very dry, hot, atmosphere, this natural moisture the raw cotton possesses is evaporated.

Cotton fibres, when robbed of a certain percentage of moisture, will, while being manipulated, become tender and slippery. This is often found to be the case when the temperature runs low and the rooms become chilly. When this occurs, cotton fibres become separated, which fact can be readily observed by standing at the slubber, intermediate, roving or fine frame, as the case may be, as the roving is taking in the twist. The fibres stand out in every direction. This condition of things may last three or four days, when all at once a sudden change in the weather occurs, and when the dry, windy weather is superseded by a damp season.

The electricity takes its flight, and cotton fibres not only assume their natural condition, but on account of the excessive dampness of the atmosphere, pass beyond it, and, if the weather continues damp, will be found to have lost a certain percentage of vitality.

Cotton fibres, when highly charged with electricity, will soon become tender and slippery. When cotton becomes permeated with dampness, it drops apart at the slightest touch. Take, for instance, cotton sliver at the drawing frame when the air is full of humidity, and see how it runs slack, and is often found lapping onto the rolls. There is too much moisture entering into the work, and so the changes in temperature and humidity are constantly taking place.

Dirty, foggy weather will also affect cotton spinning, especially when referring to fine counts of yarn, which takes a long time to spin. Electrical action, as previously referred to, influences individual cotton fibres to stand out from the body of the yarn, and in turn catch particles of fine, black dirt held in the atmosphere.

This feature is always more readily noticed towards the bottoms of the cops, owing to those parts being longest on the spindles, and being nearest spindle bolster and carriage.

This feature will also speak well in favor

of a good ventilating humidifier which in turn will keep the atmosphere purer, preventing foggy, or other weather, from dirtying cops during the process of spinning.

A good plan for perfect cotton spinning, both with reference to quantity as well as production, is to keep the atmosphere inside the mill as near to one thing as we can do conveniently, hence the advantages of a good and reliable system of humidifiers cannot be underestimated.

Another adjunct to cotton spinning, besides the yarn spun itself, and which is very susceptible to a radical change in the atmosphere in the spinning room, are the spindle bands, both on ring frames and on mules, and especially where these machines are next to a staircase door or to a line of exposed windows. It will also be noticed that sometimes driving belts are also affected by variations in the weather, all items worth while to take into consideration if ever questioning the value of installing a reliable humidifier plant in a cotton spinning mill.

Besides items quoted, the leather coverings of the drawing rollers on the drawing frames, sliver and ribbon lap machines, fly frames, mule and ring frame, are also liable to be affected by considerable variations in the weather.

An objection urged against humidifiers in connection with combs and cards, is that they have a greater or less tendency to rust the combs of the former, and the teeth of the clothing of the latter. However dry, frosty days or dry hot summer days will show their influence upon the carding engine, and when it may be noticed that the doffer comb appears unable to properly strip the carded film of cotton from the doffer cylinder. Again take the comber or ribbon lap machine, and when in extreme scarcity of humidity, the cotton will lick to the feed rolls, curl in the collecting tins, too weak to be carried along the front table to the draw box.

Without doubt in many cases, a good sprinkling of the floor with water has proven a remedy. If ever installing ventilators in a card room, draw the air first over the fly frames, and finally over the cards, as if the opposite arrangement should be installed, the dust from the cards is drawn to the fly frames with its consequent harm to the roving.

With changes in the weather, possibly one of the worst features in a cotton spinning mill will be found in the fact that more frequent wrappings of the cotton must be made at the various spinning processes, and if care is not exercised there will be an upsetting of the counts at one machine as will be hard to be quickly corrected on the successively following machine.

For instance, a carder alters his fly frames, and at the same time the spinner may alter his mules or ring frame to suit a certain sliver or roving, and possibly within a short time, things will be found just as bad, or worse, in the opposite direction; a feature somewhat similar to the weave room when goods come heavy on the perch, and picks are taken out on the loom without reeling the yarn then weaving (which then possibly may be on the light side of the count, whereas first it was on the heavy side), or as will be readily understood, the reverse affair may be the case from perch to loom.

By this we mean, go carefully to work when making a change, go hand in hand with the room preceding and following, provided you have the interest of the mill at heart.

With reference to ventilation in a cotton spinning mill, spinning fine, smooth, high counts of yarn, the gassing rooms are amongst the most unhealthy for any millworker, hence the importance of a perfect ventilation for these rooms. Any person will readily understand that the constant burning of a large number of gas jets will heat and stifle a room, hence the necessity of ventilation.

Ventilation is simplified if no other room is situated over the gassing room, since then ventilators can be applied to the roofs. The inlets for the air should, however, wherever possible, come underneath the frames. Under all circumstances the ventilation must be sufficient to change the air every few minutes, and at the same time care exercised that no excessive draft is created, hence the importance of putting this work, when installing ventilators, in the hands of a competent engineer in that line.

PRACTICAL POINTS ON COTTON SPINNING.

THE FLY FRAMES — WORN ROLLS.

The replacing of worn drawing rolls with new ones is a most important affair for the overseer, a usual system observed being to allow the replacement of so many rolls per hundred spindles in a given time, the number depending upon the condition of the fly frames in the mill, the care given them, the kind of cotton and counts of hank handled; for the reason that a coarse grade of cotton and naturally a low hank will wear out the rolls quicker than a high or fine hank, again new fly frames will be less hard on its rolls than old or run down frames. The guides should be set so as to traverse the sliver or roving as close to the ends of the rolls as possible. By thus properly adjusting the guides, rollers can be used much longer than if not using all the surface available. All rollers in the room should be at least once a month examined by the overseer or his assistant and any defective ones replaced by new ones.

Considering spinning medium counts of yarns, an average of 3 new rolls per week for each slubber and intermediate frame, and 4 for each roving frame is a fair allowance. At the same time remember that the rolls in the frame, for this purpose of replacing worn out rolls, have to be displaced, removing the front rolls to the second set and those from the latter to the back row, in other words throwing out the rolls from the back row in order to keep the rolls in the front row in the better condition.

BAD AND UNEVEN ROVING.

Carelessness, of course, in many instances is responsible for many faulty rovings. Uneven laps from the scutcher and as fed to the card will transmit this inequality to all future processes in cotton spinning, so will bad carding and "single" in the drawing frame lead to inequalities which the fly frame never can completely eradicate. If the top rolls are not regularly oiled, or a sticky oil is used, this may cause the rotation of the rolls to become momentarily arrested, in turn stretching the slubbing or the roving and producing a thin place in the strand delivered. Similar trouble will result if one or the other tooth from a gear in the drawing roll drive gets broken out, and is not noticed, or neglected to be noticed, and when then the blank space comes round, the middle or back roller will momentarily stop while the others go on. If dealing with fly frames where shell rollers are used, it may happen that the tender of the machine puts two of an unequal size on the same arbor, and when on account of the larger part of the weight evidently being on the ends, the draft of the slubbing or roving during its traverse over the heavily and lightly weighted parts is affected. Bad work, besides shortening the life of the rolls considerably, will also occur provided top and bottom rolls are not in line with each other. Always be careful when replacing any worn out gears, that the right gear is substituted, for if a slightly different size gear thus used, it may be the cause of throwing the distribution of the drafts wrong, and be the means of trouble and inconvenience to the overseer. If for one reason or the other, roller weights are taken off, be sure to replace them in their proper place, since if they are put back in wrong places, for example the heavy ones on the rolls where the light ones were and vice versa, it will cause trouble in the roving.

Be careful not to use an excessive draft on fly frames, for it will cause uneven roving; however, at the same time remember that too little draft on a fly frame will result in hard ends or undrawn roving. Roller laps increase or reduce the draft, and consequently slightly alter the hank. Be careful that the flyer has dropped in its slot properly before the machine is started. See that the clearers, especially if dealing with frames set for handling long staple cotton, are picked sufficiently often, otherwise this clearer waste will occasionally be licked up by or drop into the slubbing or roving, in turn making a heavy slub, which in turn, as a rule, will break at the back of the mule or ring frame and thus be the cause of waste in material, loss in time and annoyance to the spinner; however, if it passes there, a long thick place is the result in the yarn. When

roving is cut (thin places) at regular intervals and such places are about 3 1/2 inches apart, a bad lap on the top roller (circumference of said roller about 3 1/2 in.) in most cases is at the bottom of the trouble; again if such thin places are about 12 inches apart, a bad middle roller very likely is at the bottom of the trouble.

LONG AND BAD PIECINGS ARE A DISTINCT EVIL.

For this reason when putting bobbins in the creel, or making piecings at the front, make them short and not too hard, for if they are made long it will cause the roving to be too thick at this place; whereas hard piecings will not draw when in turn passing between the drawing rolls, resulting in a lump which at the next process will cause trouble. Wet piecings will also cause trouble, they having their origin in that when an end breaks, the operator in piecing it up frequently wets and slightly twists the end (the same as you will thread a needle) in order to more readily thread said piecing through the eye of the flyer. This wet and twisted end in turn should be broken off by the operator before piecing up, but when this is not done remember that this wet piecing will not draw in the next process. Never twist the end for threading through the flyer eye more than absolutely necessary, for the fact that even if the wet end is broken off, the thus heavy twisted roving end will frequently fail to draw.

MENDING BROKEN ENDS.

When for one cause or the other, possibly on account of a bobbin being under the bobbin rail of the carriage, the cone belt breaking, teeth in draft gear worn out or breaking, draft gear slipping, or collars not fast on spindle rails, etc., an end breaks between the front drawing roll and the bobbin, it generally winds itself more or less around the boss of the flyer, and when in turn the machine has to be stopped for piecing it. The operator then unrolls about 2 1/2 feet of slubbing or roving from the bobbin, and after slightly twisting it, winds it round the presser foot as many times as before, then through the flyer eye, up the leg of the presser, through the eye in the boss of the flyer, and twisting, i. e., piecing it then on to the other end as projecting through the front rolls, and when after adjusting the bobbin so as to leave as little slack as possible, if any, he in turn then starts the machine. To see if proper tension on the roving, while the frame is running, lower yourself sufficiently so as to get your eye on a level with the flyer, and look from the boss of the flyer to the front roll, thus readily noticing slack roving. Slubbing or roving only slightly slack will run all right for a short time, when it will curl around the boss of the flyer, and then run smooth; if, however, too slack it will then break.

EMPTY AND FULL BOBBINS.

The use of the proper size bobbin for a fly frame is a most important item, for only in that way quality and production of work can be obtained. Provided different makes of fly frames are met with in one mill, bobbins will get mixed except proper care is exercised to keep them separate and with two sizes of bobbins on one frame it is next to impossible to keep the tension right, for the fact that if the operator tightens the tension on account of the slack running end, he thereby will strain the roving on all the other spindles of the frame. All bobbins should be wired, and in a mill running on low hank work, where they are handled frequently, bobbins with a metal base are the ones to use, for although more expensive at first cost, they on account of lasting longer than common wooden bobbins, will be the cheaper ones in the end.

Bad bobbins with reference to full bobbins are such as contain "single" or "double," or such as are soft in consequence of the slubbing or roving having been broken down too long before noticed. By unwinding these bad places in the waste, except if dealing with too bad a case, they thus can be used in the creel of the next process machines. Oil or dirt from the machine dropping on slubbing, roving, or bobbins, will also result in bad bobbins. Running over and under of the roving on the bobbins may now and then occur, and if such is the case see that all the gears from builder to carriage, as well as the twin gears and their clutch gear, are not badly worn in the teeth or slack in the studs,

also see that these gears are geared sufficiently deep. Improper taper given to the bobbins by the builder motion may in turn result in tangled bobbins, for if the taper is too steep, with rough treatment some of the strands will slip off. On frames using the Hill builder, the spring may be out of order, or more frequently the end of the sliding jaws worn down, that the motion does not change at the proper moment. If this is the case, file the arms and put on a steel plate having a square end. If the bevel gears on the top cone shaft or those on the upright shaft are worn to such an extent that the teeth fail to engage, a temporary remedy is to raise the upright shaft and put a cent piece in the step. If the large or skip gear is worn, and two or three teeth only are affected, change it to a reverse frame, in this manner bringing the teeth on the opposite side of the skip and which are not worn, into use.

In connection with a ratchet gear builder motion, the triggers may have become worn at the corners, a feature which will cause the motion to change at irregular times, resulting in turn in a bad taper. When setting this motion its tooth lever must be level when the carriage is in the centre of its traverse. Sometimes bobbins run off owing to the frame being stopped just at the change, or possibly owing to the winding being very slack.

If the coils on the bobbin are laid too widely apart, the speed of the top rail or lifter must be reduced in proportion, the rate of delivery and the winding on of the roving remaining the same. In some instances a less teeth strike wheel may suffice, whereas in other cases a wheel belonging to the short lifter shaft train wheels at the end of the frame has to be changed.

Flyers must be kept smooth at all points where cotton comes in contact with any part, they must fit perfectly on the top of the spindles, and the wires kept in good condition to prevent hammering down in position by the operator, which in turn will roughen them at their top. Soft bobbins and a weak roving may have their origin in a stiff flyer leg, which will not properly submit to the centripetal force produced by the revolution of the flyer.

Empty as well as full bobbins should be kept in boxes or baskets and not lying around on the floor. Keep one process of fly frames as close up to the preceding one as possible, also the last process in the same way to the spinning room, for the reason that old roving sizes somewhat differ from new. When bobbins are returned from the creel of fly frames, or from the spinning room, they are then not always entirely empty of all the roving, which then is either cut off, or more properly pulled or twisted off the bobbins.

SPEEDS OF SPINDLES.

The builders of the various fly frames designate the most appropriate speed to that effect with reference to the different sizes of frames they build, however it sometimes may be advisable to slightly vary this speed to suit a certain grade of cotton, condition of machine, or hank under operation. in turn running the machine somewhat slower or faster, as the case may be. Old fly frames, or such as running on coarse work, or where a low grade of cotton is used, and when such frames then can be run at a higher speed as compared to former conditions. Do not overspeed your frame, since there is a limit to the speed of every machine, beyond which it is not advisable to go on account of excessive speed being the means for developing defects, again unnecessary tear and wear to the machine will be the result, ends will break down more frequently, and we must remember in connection with the latter item that the frame has to remain stopped for piecing up, even if only one end breaks, hence loss in production.

MANAGEMENT OF BOBBINS ON CREEL.

Never have the bobbins on the creel of one size, but have them of two or more different sizes, so that the tender will not have to fill the creel with new bobbins all at one time. A good plan is to run the bobbins in two sections, i. e., have one-half of them half full while the other half of the bobbins in the creel are either completely full or about empty. When in this case meeting with some extra large bobbins and which are not running out with the rest, they may be taken out of the creel before they have be-

come empty, in order to equalize its set in creel. These short pieces of bobbins, in turn are then used up at the end of the creel, and where they are more conveniently under the eye of the tender of the machine. Following up the procedure thus referred to will be the means of preventing chances of making singles. In place of dividing the running out of the bobbins into 2 sets, the same can be split up into 3 or 4 sets or sections if so desirable. About 3 rows of full bobbins are kept in reserve on the top board of the creel, so as to be handy for the tender and at the same time prevent frames from running short of slubbing or roving. See that full bobbins, when in the creel, do not touch each other, since friction thus created would prevent the ready unwinding of the bobbins. To prevent too hard twisted bobbins (provided such are met with) from over running, retard rotation of the skewers by inserting under their feet some cotton, again if meeting with bobbins containing insufficient twist and in consequence of which they are continually breaking, sharpen their skewers so as to lessen friction.

CLEAN MACHINES REGULARLY.

Only in this way may quantity and quality of work be produced. Brush the creel down twice a day, and pick flyers on medium work at every doffing, and oftener in connection with fine work; never fan them off, since this causes bunches to catch with the work. Clean gearing of head end of machine twice a week, and spindles and bobbin gears, etc., once a month.

Keep head of flyer clean, also slot in top of spindle, in order to provide a perfect fit for the pin in the slot. Never permit hammering down of flyers in order to bring them in proper position on their spindles, for the reason that this will produce rough places, which in turn will catch lint and consequently strain the roving. Broken or worn pins must be promptly replaced by new ones, i. e., perfectly fitting pins, since otherwise the flyer will be loose on its spindle. Rolls and clearers must be also kept clean, or coarse threads or lumpy yarn will be the result. The steel rolls should be scoured at least once a month or oftener if possible.

GEARS.

Previously to starting any fly frame, after gears have been changed to suit a certain hank, examine carefully that none of them will slip, after which start the machine slowly. Draft and twist gears generally are alike in every frame of one make, provided hank fed and delivered corresponds, whereas lay and more particularly tension gears, vary with individual frames, and when the proper size of the gear has to be decided upon by practical experience on the part of the overseer or his second hand, and when in many instances even if dealing with one kind of hank and one make of machinery, a difference of from one to three teeth may be necessary.

OILING.

In large corporations this is in the hand of a mechanic specially hired for this work, whereas in smaller concerns it has to be done by the section hand or assistant to the overseer, and never should be left in the hands of the operator of the frame.

The front rolls, as well as any rolls or gears run at about a similar speed, both cones, the horse head, the jack shaft, the carriage slides, as well as particular points of the differential motion and all bearings around it, should be oiled daily. The frame tenders, on Saturday before leaving work, should unhang the weights on front rollers, take off the shells, and wipe the arbors dry, oiling them as well as the middle and back rollers carefully Monday morning before starting. Thus the oiling of the rollers cannot be neglected, neither will they run dry, and in turn be the cause of cut and uneven roving. It now and then may occur, from the lack of oil on previous occasions, that saddles and stirrups have worn to an exact fit, and if then the rollers get the least bit out of alignment, they will bind and momentarily stop, and in turn also be the cause of cut roving.

The screws in such differential motions whose construction will permit it, should be taken out and oil applied, and once a month the differential motion itself slipped apart and cleaned and oiled, using tallow in connection with the internal gears of the differ-

ential, provided they are run at high speed. All other revolving parts of the machine should be oiled weekly or oftener. The spindle feet should be oiled at least once a month.

An improved self oiling step is used in connection with the Woonsocket fly frame, which step contains a reservoir for oil, and which needs refilling but twice a year. By holes drilled through the partitions between reservoir and bearing, oil enters bottom of bearing, and is siphoned back into the reservoir through the top; hence the chief loss of oil is only by evaporation. Owing to the quantity of oil thus able to keep constantly in bearing and reservoir, the bottom of spindle is never without a cushion, which guarantees a steady running spindle. A large plug in back of the reservoir admits of its being cleaned out should the oil become thick from long usage, and at the same time allows the spindle gear to lift out of connection with the spindle shaft gear, allowing the spindle to stop should any foreign matter clog up the bolster, or in case the same should become dry for want of oil.

Spindles are oiled twice or three times a day (very little oiling will do) at the places where borne in the collars, it being usually done after each doffing, except if dealing with very coarse or very fine hanks, and when doffing occurs either too often or not often enough during the day. Each spindle on a frame must get its proper attention, hot spindles, if there are any, being taken out and oiled each doffing, since they will heat the shellac on the bobbin and cause it to melt, in turn making the slubbing and roving adhere to the bobbin, ruining the latter, besides being the means of waste in material.

If the ends, as coming from the front roller suddenly slack down and tangle at the flyer, either the cone belt is broken or a gear slipped. Provided this trouble is not too pronounced, i. e., the ends do not tangle badly, the slipping of the cone belt may be at the bottom of the trouble, or the slipping of a set screw may be the cause. If the trouble occurs continually at a certain point in the lift of the carriage, then this is a sign that a motion somewhere is binding and in turn causes the cone belt to slip. The chief cause for such trouble, in most instances, will be found in careless oiling of the frame, or not keeping all its vital parts cleaned, since it takes only a short time for oil-holes to get choked up with lint, and the oil as applied to it consequently wasted.

Be careful that no oil gets on the slubbing or roving when oiling the rollers, also that no oily lint as accumulates around the spindle at the top of the bobbin, is carelessly thrown in the box with good slubbing or roving, for it will stain the good waste; hence remove this oily waste before doffing, especially when dealing with roving intended for fine yarns and fabrics, and where a thus stained (black) thread, if not detected and taken out, may be the cause of making the piece of cloth "second." In connection with roving intended for cheap yarns and fabrics, i. e., low hanks of roving, this trouble will be of less consequence, since in this instance doffing is done too frequently to permit the accumulation of waste. Be careful not to use dark color crayons for marking roving, since places thus marked will show in the yarn, and if not removed, in the cloth.

The horse power required to drive fly frames varies somewhat with reference to build, as well as size of machine under consideration, a fair average estimate being: Slubbers about 50 spindles per h. p., intermediates, about 60 spindles per h. p., roving frames about 75 spindles per h. p. and jack frames about 100 spindles per h. p.

In some instances it may happen that for one reason or the other, we may have to run white and colored stock on one machine. Since colored stock, as a rule, has not the same elasticity as cotton spun in its natural state, if running both on same machine, proper care must be exercised in regulating the proper tension for each, and for which reason it may be found advantageous to give the colored ends a coil less or more on the presser, in order to help to regulate the tension.

Bergamot is a common tapestry made of ox and goats' hair with cotton or hemp, and believed to have derived its name from the town of Bergamo, Italy.

THE IMPORTANCE OF THE BRUSH IN THE FINISHING OF WOOLENS.

The brush as used in various forms in the finishing department of a woolen mill occupies a prominent position in the various finishing processes of woolen goods. In some instances it may serve the purpose of raising the nap of gigged cloth, as for example in the process of shearing, whereas in other instances brushing has for its purpose of smoothening the wet or dry nap.

The brush is also in some instances used for wet laying the nap (wet brushing or wet gigging), for which purpose worn teasels were formerly used, and, as far as experience goes, the brushes specially made for this purpose giving satisfaction, and at the same time resist the moisture.

Wool fibre will retain the position imparted to it in a wet condition, and if it becomes disarranged in the dry state, it can, by dry brushing be readily brought back to its original position, consequently, the more carefully the fibre is smoothed before drying, i. e., the better the cloth is brushed, the nicer and smoother the nap will be after drying. To accomplish this, proper brushes are a necessity. They must neither be too stiff nor too soft, nor excessively worn. The bristles of an extremely soft brush will not penetrate to the bottom of the cloth, while such as are too stiff, either by nature or wear, are rather inclined to raise the nap instead of laying it down firm and smooth, and when a want of smoothness to the nap of the fabric under operation is the consequence in both instances.

To preserve brushes in good condition, it is necessary to clean them from time to time. With a tentering and drying machine which is kept steadily at work, this operation of cleaning should be performed at least once a week. Clean your brush regularly, for if the brush flocks collecting at the bottom of the brush are allowed to remain there, the elasticity of the bristles is diminished, and when a brush in this condition can be compared to filled card clothing. Moreover, when the flocks in the bottom of the brush reach a certain thickness, they prevent the bristles from penetrating to the bottom of the cloth under operation.

The use of good brushes on the shear, as will be readily understood, is of great importance, since no amount of shearing can remedy defects caused by bad brushes.

We may occasionally meet with shears equipped with old and worn brushes which in turn do not run true, their journals will rattle in their bearings, the bristles of the brushes being worn down to what we may say stubs in some places, whereas they are longer in others, having only preserved their original full length in such places of the brush where they do not come in contact with the cloth. The bristles of such brushes in such a case certainly have only preserved their elasticity in part. The short, hard bristles will dig in the nap of the cloth, and in turn tear out the bottom fibres of the nap, the brush being placed close to the fabric for the reason that it will not work otherwise at all points, on account of the unequal height of its bristles. The result obtained in connection with the use of such a brush will be that the nap is cropped closely at the points where it is dug up by the bristles. Such a napped surface, forcibly torn up by the repeated passages of such a brush can never be smoothened again in a dry condition, no matter how hard and how long the dry brushing would be carried on, and for which reason the only remedy in connection with such a fabric thus treated is to wet it again and in turn re-gig it, being careful to use the next time a shear having a perfect brush. The finished fabric previously treated with poor brushes cannot help but present a rough and uneven face, threadbare in some places on account of the nap being torn up sharply and in turn sheared closer than at other places, presenting a finish under all circumstances inferior to the finish on a fabric treated with perfect brushes, brushes provided with good elastic bristles set in a true running brush roller.

The unequal wear of the brushes, and more especially their warping and drawing out of true, can usually be traced to the faulty construction of the old brush rollers, for which reason machine builders have in recent years greatly improved the brush rollers.

Another important point to be considered is the condition of the bristles. These must

neither be so stiff that they tear up the cloth unnecessarily nor so soft that they will bend easily.

To keep the shear brushes in perfect working order reverse them from time to time, at least every three or four months, and when in turn the unequal wear of the brushes is thus avoided, for ordinarily the fabric is not sufficiently wide to cover the entire width of the brush. On the so-called cutting side (the right side), a part of the machine, as well as of the brush, remains free, and as a result the latter is worn either very little or not at all at this end, and the bristles remain longer. As wider and narrower fabrics are most generally worked alternately, the brush will gradually taper more and more toward the end which is most used, a feature which can be prevented by reversing the ends occasionally, and the brush will then remain at a uniform thickness.

The reversal of the ends of the brush is also advisable for the purpose of straightening and stiffening the bristles and increasing their resistance, since from the continual rotation of the brush in one direction, the bristles are apt to become bent and assume the direction of motion of the brush.

For the final clipping of the fine grades of cloth on the shear, a plush roller may be used to advantage in place of the brush. The lifting of the short nap upon steam-lustred cloth it is claimed is better accomplished by plush than by a bristle, i. e., brush roller, and the shearing thereby becomes smoother and more uniform. For these plush rollers absolutely true motion is of great importance, and frequent cleaning is advised. Such rollers should be reversed more frequently than brushes, as the brush becomes ineffective more readily if it works for a long time in one direction. Besides this, such rollers should be recovered often. The recovering is done either by wrapping spirally around the roller a strip of plush fabric similar to the covering of a roller with card filleting, or by slipping over the roller a sleeve previously sewed so that it fits tightly. The latter method is preferable, if it is done well. The plush roller must be arranged in such a way that the cloth, after leaving it, does not pass with its napped side over a guide roller, as the raised short nap would be pressed down again, and could not be seized by the cutting apparatus. In the shearing of fresh cloth, the nap of which is raised by the brush, this danger is of little consequence.

Shears can be provided with both brush and plush rollers, either one of which may be put in action as required and the cloth manipulated in such a manner that it can be treated by either the one or the other.

The quality of the brush is of less consequence when the latter is used for raising the nap on the back of the cloth, should this be required. In such a case the brush used is generally a little stiffer than that employed for the face. It is only necessary that the brush for the back be uniformly stiff throughout. Should it have worn spots, there will be certain places where contact will not take place, and this will cause shear stripes.

Besides the drying and shearing machines, the brushing machine and the rotary press of the finishing room must be considered, for in both cases the proper brushes play a most important item. The sharpness of the brushes for the brushing machine drums must be suited to the purposes for which the machine is intended. For brushing the cloth between the operations of shearing, or after the first clipping for steam lustering, sharper brushes are necessary, because a deeper nap is to be treated, and besides this, the loose shearing flocks, clinging to the cloth, must be removed. On the other hand, for brushing ready shorn cloth, softer brushes are required, in order to obtain an elegant nap. This applies especially to brushing machines with steaming apparatus, in which the cloth is brushed immediately after leaving the steaming table. If a slightly extra sharp brush is used at this point, the short nap softened by the steam will rise, making the face of the cloth blurred and rough. The softer the brush used at this time, and the lighter its touch upon the cloth, the smoother and more elegant will be the finish obtained. For the rotary press no unduly sharp brushes are to be used, especially when this machine is used for pressing the cloth previous to making it ready for the market.

COMBING.

(Continued from April.)

There are several methods employed for the regulation of the amount of noil taken out of the lap, the following items all tending to increase the amount of noil taken out and vice versa, viz., the earlier the comb is dropped, the later the nipper is closed, the greater the angle of the top comb, the later the feed, and lastly the closer the settings. As a matter of fact, the first and second points are hardly ever made use of, since these timings should not be tampered with, as bad work would invariably result. Changing the angle of the top comb might be resorted to by a skilful operator, but as 31 degrees angle is a good rule for setting the top comb, it should only be changed on special occasions. Later feeding can safely be taken advantage of, and the amount of noil produced may be varied by this means safely to the extent of 4 per cent. The feeding operation commences just before the leather detaching roller comes into contact with the fluted segment. By delaying the feed, the leather detaching roller and fluted segment cannot grip all of the fibres sufficiently well, with the result that those which are slightly shorter are left for the cylinder needles to be taken around the noil.

By the setting of the nipper knife to the cylinder needles, and the top comb to the fluted segment, the amount of noil is also easily regulated, since the deeper the stock is pushed into the path of the needles of the cylinder as they pass, the larger will be the percentage of noil removed, while, if the cotton under operation is not forced sufficiently far into the needles, the same, as they come around, will not pass thoroughly through the stock, and thus have a tendency to leave short fibres in the cotton, a feature which will be at the expense of the quality of work produced, if this practice is carried beyond the proper limit. By setting the top comb nearer to the fluted segment, the amount of noil removed will also be increased, for the reason that the comb will penetrate deeper into the lap of cotton under operation, permitting only those fibres which are gripped firmly by the fluted segment and leather detaching roll to be drawn through the needles of said top comb, and when consequently more of the short fibres will be held back by the comb to be in turn removed by the cylinder needles on the next cycle of operations; while on the other hand, if the top comb is set so that it does not approach as close to the fluted segment, the fibres will pass, to a certain extent, underneath rather than through the comb and hence many fibres will escape its action that would otherwise have been removed. Careful adjustment of the nipper is also a very important point in the regulation of the amount of noil made, for which reason care must be taken that the cushions are as straight as it is possible to get them, also that the nipper knives are parallel and are nipping the entire length of the cushion plates, in order that the stock will be held firmly throughout its entire width and thus prevent any portion from being pulled out by the cylinder combs and taken around as waste.

The condition of the detaching rolls also affects the percentage of noil made to a considerable extent, those that are uneven or which have been made rough by using a poor varnish and which has come off of the rolls in patches, will necessarily produce an excessive amount of noil.

Where a very heavy lap is used, and combers are driven to their uttermost capacity, every advantage possible must be given the needles to perform their work efficiently upon the fibres, which, owing to the character of the lap, will necessarily result in a large production of noil. In order to reduce this percentage without altering the timing and setting of the parts, weights are frequently added to the leather detaching rolls, i. e., 3 or 4 lb. weights are hung on each hook to answer the purpose; but this is not a common practice and is only resorted to in mills where heavy production is demanded. While this plan will do much toward reducing the noil, it is ruinous to the leather detaching rolls and can only be practiced favorably where a wound leather roll is used, as a cotted roll is not so substantial and would be quickly destroyed by the excessive pressure on the steel detaching roll.

The fact that a great many rolls are run several months after having outlived their usefulness, the plan thus mentioned would answer the purpose of getting rid of these bad rolls, which in some instances are run as long as they hold together sufficiently to take another coat of varnish. This practice of using rolls after they are worn out causes a great many fibres to be left behind which should have been incorporated into the combed film of cotton.

Methods have thus been given for taking the noil and waste out of the fibres, and the next item is to keep them out. Unless the machine is kept perfectly clean, a large part of the good results gotten in the combing process is lost, as it is clear to everyone that if the waste is left through carelessness in such a position as to be again incorporated into the fibres which have been combed, no material benefit will result from the expensive operation. Neglect of the comber will very soon be made apparent by the appearance and quality of the yarn spun from the combed fibres, while with care and proper attention to its operation, the yarn produced will be of the highest quality, a result not obtained by any other process in its manufacture.

SETTINGS AND TIMINGS.

The key note to the successful working of a comber is the proper timing and setting of the different motions. To have any one of the motions working out of exact harmony with the others is to sacrifice the efficiency of the machine, and therefore there must be some arrangement by which the timings and settings can be easily and accurately made, otherwise the time and labor of setting the different parts would prove very expensive and could not even then be made with entire satisfaction.

The arrangement used for the proper timing consists in an index wheel on the cylinder shaft. It has 80 teeth and its circumference is divided into 20 equal parts, the divisions being numbered from 1 to 20. There is an index finger which is stationary, and all settings are made by placing the required number on the index wheel under the index finger. The cam shaft is driven from the cylinder shaft by means of another 80 tooth gear, so that the two revolutions are the same, and the cams on said shaft can be set from the index wheel without additional figuring for the proper number.

The settings and timings to be observed with reference to the comber as built by the Whitin Machine Works are thus:

Cleaning the Parts of the Combing Machine. All shafts in the combing machine should be taken out and thoroughly cleaned. All the shaft bearings should also be cleaned before the shafts are replaced, as well as other parts of the machine that may be covered with grease or other preservative.

Setting the Shafts. It will be found most convenient to replace the shafts in the following order: lifter and nipper shafts, 1 1/4 in. and 1 1/2 in. diameter, running in the base of the upright stands; cylinder shaft, coupling this to the short shaft that carries the index gear; driving shaft; cam shaft; notch wheel shaft. See that all caps are screwed firmly to their places and that all the shafts run freely after the caps are well set up. Put the large gear covers on head end of the machine and see that they do not interfere with the moving parts of the machine.

Setting End Cam. Put on pawl arm with cam roll on it. Set these caps up hard. Throw 80 tooth gear out of mesh by sliding endwise, and turn cam shaft until the roller in pawl arm is in the heel of the large cam on the end of the machine. Turn the index gear till the number 5 1/2 stands opposite the pointer and slide the 80 tooth gear back into mesh and bolt it to its sleeve.

Fluted and Needle Segments. See that the fluted segments are screwed down firmly, and then put in needle half laps and screw them down firmly. Be sure and have them thoroughly cleaned. Put small tin casings between the two segments and see that they fit closely.

(To be continued)

The experts before the British Tariff Commission stated that the cost of manufacturing cotton goods in Great Britain, including the cost of building and equipping mills, is lower than on the Continent or in the United States.

CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

THE NOBLE WORSTED COMB.

BY THOMAS BINGHAM.

DESCRIPTION OF WORKING PARTS.

When the Noble was originally invented the foundation consisted of four stout legs, which if erected on an uneven floor had to be packed with various materials which were always in danger of working out or giving way, throwing the machine out of twist and causing strain on the working parts, thus increasing wear and tear.

In the latest models, the legs are done away with, and in their place we have a strong shell, support and bed plate being practically all in one piece, resting on a foundation plate, so that if the floor should give way a little, the whole machine moves bodily, keeping all parts in their relative position to each other, thus taking away all risk of strain.

On this base plate four short pillars are bolted, Fig. 1, which support the bed on which the circle carriage rack runs. This bed and also the rack are recessed to receive steel balls. All machines are now made with ball bearings, only insuring lighter running and easier drive. The bed, plate rack and balls are so accurately fitted as to do away with any shake or irregular running of the circle. This is a vast improvement on the old style of runners, where the steam chest was the only stay. The bed plate itself is made in different styles by different makers. Hoyle & Preston have bed and cross bar all in one piece, the pillars for the driving shafts resting on cross bar. Prince Smith & Sons do away with cross bar, fixing pillars on capstan bearings direct to gear plate. Taylor, Wordsworth & Co. fix pillars to cross bar. All three makers now supply somewhat shorter pillars in order to decrease the risk of vibration to which the machine is liable, owing to the driving being so far away from base.

Formerly the pillars were always cast in one piece. This has been found to be a great inconvenience when circles have to be changed, either for repairs, or for changing to a different class of wool requiring either finer or coarser combs. Fig. 2 shows Hoyle & Preston's method of getting over the diffi-

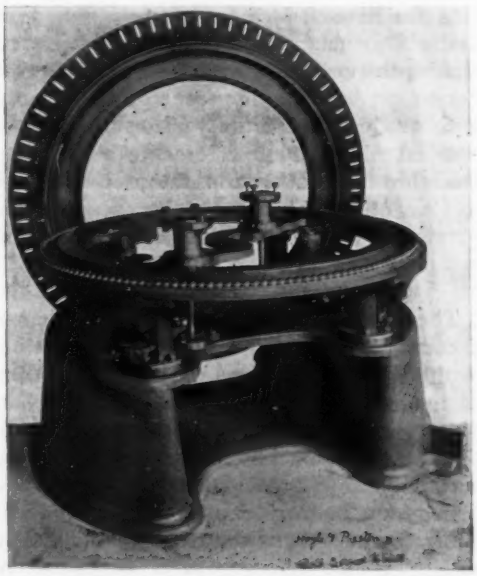


FIG. 1.

culty. It will be noted that the pillars are flanged near the bottom and by simply loosening four bolts the top part can be drawn up clear of the remainder of the machine, and the circles lifted off and replaced without interfering with the gearing at the base of the machine. The upright shaft, just visible below the pillar base, is square cut and when the pillars are lowered the cut drops into a square recess cut in bottom portion of shaft, thus forming a solid joint.

P. Smith & Sons cut pillar and shaft in a similar manner, but instead of a square coupling, the connection is made by an annular drive. In both cases, there is perfect alignment when pillars are lowered to proper position and no risk of slipping in the drive of machine.

1st. It places the circles in a better position for access when anything requires to be altered. Previously the pillars were always in the way, and no little job could be done without a certain amount of discomfort. The greatest gain is found when the circles require to be taken off, either for repairs, or

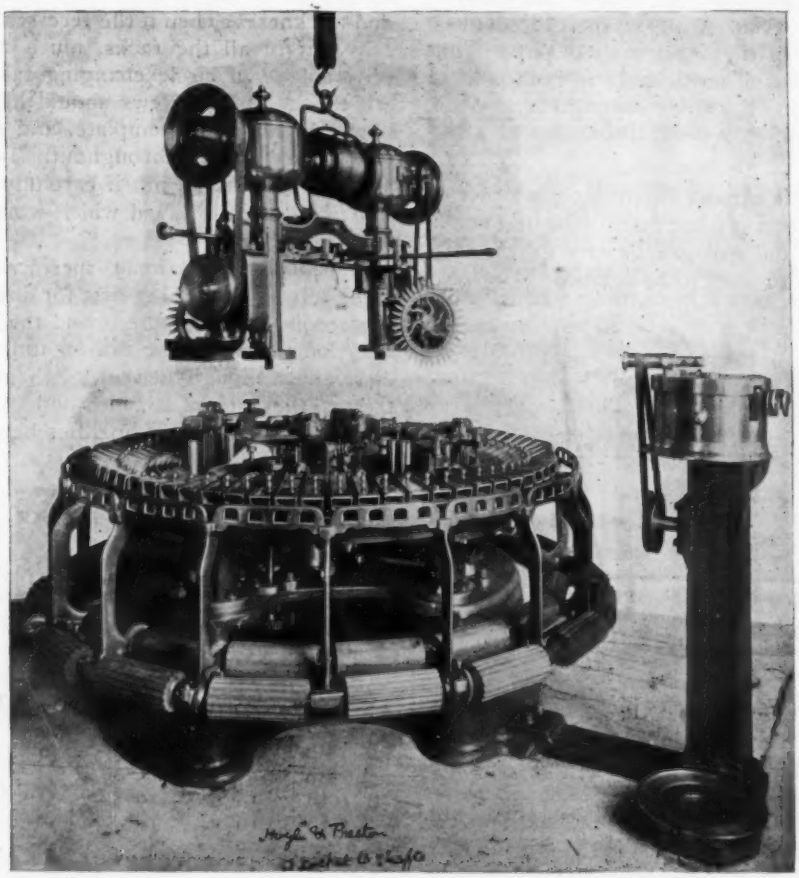


FIG. 2.

Taylor, Wordsworth & Co. have gone one better. Instead of cutting the pillars into two parts, they have taken the small circle away from the base of the pillar, moving all working parts relating to small circles away from the line laid down by Donisthorpe and followed by all machine makers until this innovation of Taylor, Wordsworth & Co.

If this is carefully examined it will be seen that there is a far greater gain than appears at first sight.

to change for another class of work. By simply lifting out knives, and taking off supporting leg of dabbing motion, the circle can be lifted clean off.

2d. If the large circle requires changing, everything is so arranged, that by taking out knives and comb screws, then lifting off press knife (which, by the way, is now fixed in a permanent stand with one bolt, and cannot be put into a wrong position), the job is done. In fact, on a test taken in the presence of

several practical combers recently, a machine was stopped and in 5 1/2 minutes the three circles were taken off and laid on the floor.

3d. In this style of machine, the noil instead of falling (when stripped) on the outside of the comb, now falls down the inside direct to the noil box; or, as in the best constructed sheds, straight into noil bins in the cellar.

Another good point is that the highest knives are in the finest rows of pins. Thus the edge of noil most liable to hold is lifted first, ensuring the circle coming round clean, ready for refilling.

CIRCLES.

It is of the utmost importance, in order to secure the best results, that combs best suited in fineness and strength, be used for the various classes of wool to be combed. Thus, for

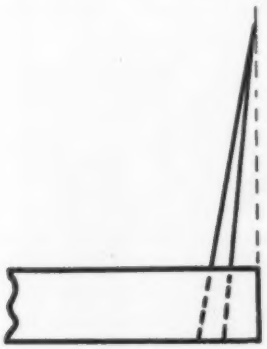


FIG. 3.

fine botany wools, circles pinned up to 44 per inch in inner rows of large circle, and 48 per inch in outer rows of small circles, are in common use.

Even finer counts have been tried, but (owing to higher gauge sizes) the loss in strength of the pins has prevented them from being very serviceable. Unless the combs have been lightly loaded, the strain on the pins has caused them to give way just at the clearing point, where it is most necessary for them to be rigid.

The front rows of each circle should be slightly overset, in order that the points of pins of each circle can be set close to each other at point of contact, without any danger of rims touching each other, Fig. 3.

If an ordinary L-square is put under the circle of the upright leg set close to edge of rim, it should just enter the points of the pins. If the pins are set at too much of an angle it makes it harder for the brush to dab the wool into the circle, thus shortening the life of the brush and adding to the expense of running.

All the circle rims used by any one firm should be exactly alike in size, i. e., breadth and thickness. Then if the recesses are carefully cut in all the racks, much trouble is obviated when circle changing takes place. All the holes for screws should likewise be bored to the same template, and the same size of screws used throughout. These may seem small matters, but if carefully followed out much time is saved which would otherwise be wasted.

Appended are sample specifications for three sets of circles, the first for fine Botany, the second for Crossbreds and the third for very long wools. Two are for four-foot circles, and although neither of them are extremes, they give a fair idea and an estimate of what is required for qualities between can easily be formed.

FINE BOTANY.

Large Circle, 11 rows.

Row.	Pins per inch.	Size of pins.	
1st	40	17 x 27	flat pins
2nd	40	17 x 27	" "
3rd	38	18 x 27	" "
4th	34	19 x 26	" "
5th	26	22	round "
6th	25	22	" "
7th	24	22	" "
8th	20	21	" "
9th	20	20	" "
10th	18	19	" "
11th	16	18	" "

Length of pin 1 5/8 inches. Set over 1 5/8 inches. Thickness of brass rim 3/8 inch.

Small Circle, 7 rows.

Row.	Pins per inch.	Size of pins.	
1st	44	18 x 28	flat pins
2nd	44	18 x 28	" "
3rd	40	19 x 27	" "
4th	36	20 x 26	" "
5th	26	22	round "
6th	22	22	" "
7th	20	20	" "

It will be noted in the case of both circles that when the third row is reached not only

are fewer pins per inch used, but smaller pins also. This increases the space between each pin, enabling the ends of the fibres farthest from rollers to pass freely towards the front of the circle, thus preventing locking or breaking of the staple.

CROSS-BRED WOOL.

Large Circle, 9 rows.

Row.	Pins per inch.	Size of pins.	
1	29	16 x 24	flat pins
2	29	17 x 24	" "
3	26	18 x 23	" "
4	24	22	round pins
5	21	21	" "
6	18	19	" "
7	14	18	" "
8	11	17	" "
9	10	16	" "

Length of pin 1 3/4 inches. Set over 2 1/2 inches, brass 3 1/4 inches wide, 1/2 inch thick.

Small Circle, 6 rows for x bred wools.

Row.	Pins per inch.	Size of pins.	
1	34	16 x 25	flat pins
2	32	17 x 25	" "
3	27	18 x 24	" "
4	23	22	round pins
5	18	20	" "
6	14	18	" "

Length of pin 1 1/2 inches. Set over 5/8 inch. Brass 1 3/4 inches wide, 7/16 inch thick.

LONG WOOLS.

Large Circle, 5 feet diameter, 8 rows.

Row.	Pins per inch.	Size of pins.	
1	18	13 x 20	flat pins
2	17	14 x 20	" "
3	14	14 x 19	" "
4	11	17	round pins
5	9	16	" "
6	7	14	" "
7	6	13	" "
8	5	13	" "

Length of pin 2 inches. Set over 4 inches. Brass rim 4 3/8 inches wide, 9/16 inch thick.

Small Circle, 6 rows, 20 inches diameter.

Row.	Pins per inch.	Size of pins.
1	22	13 x 22
2	22	15 x 22
3	16	16 x 20
4	12	17
5	10	16
6	9	16

Length of pin 1 7/8 inches. Set over 7/8 inch. Brass 9/16 inch thick.

SETTING OUT OF CIRCLES FOR DRILLING AND SCREW HOLES.

In order to secure an exact fit, and so that circles may be interchangeable, it is best to have a template for the driller to work to, then any circle will fit any other rack in the same set of combs. If the racks are drilled by the makers, when the machines are new, and are not all alike it will pay to plug the holes up and redrill racks and so secure uniformity.

Where no template is kept, a standard size of line should be adopted, then, when new circles are supplied, strike a line on under side of circle by means of a hand gauge with cutting point, say 4 feet to 4 feet 3 inches in large circle, Fig. 4, then with tram-

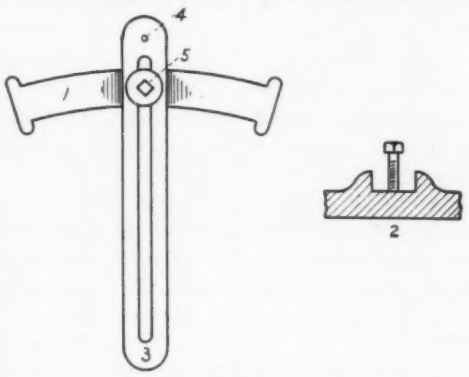


FIG. 4.

mel divide line into twelve equal parts. Then divide the small circle into six parts. In both cases it is best to have screws as near the outer edge of the circle as possible without interfering with pins.

CIRCLE CARRIAGE OR RACK.

The main feature of a perfect rack is that it should work without any vibration. If not, there is no certainty of the circles being always true to each other at point of contact. Without this there is no assurance of clean work.

The rack should be easily driven, as there is so much weight on it, especially when loaded with a full set of balls, that heavy driving becomes a serious matter.

It is necessary that the rack be heated at

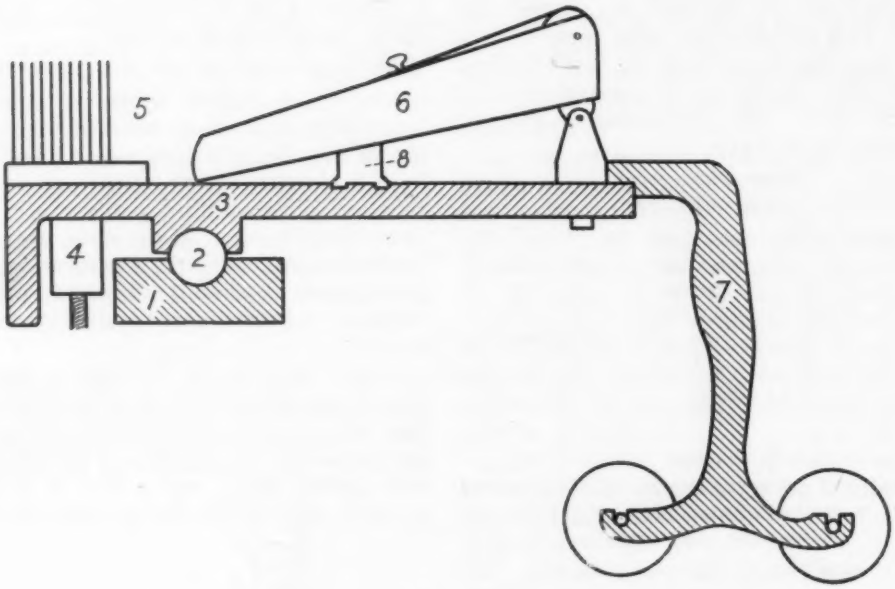


FIG. 5.

the right place, and in the best way, otherwise much steam is wasted in heating frame instead of combs.

In the older style of Noble's comb, when the steam chest was not only the heater but the sole steadier of the rack, if either the steam chest or rack became the least worn, brass wedges and other devices had to be used to keep the rack true. Many attempts have been made to overcome this difficulty by V-shaped rims, steam chests in segments, etc., all of which in their action as steadiers were also to some extent brakes, thus making the driving heavier.

The best makers now run the racks on ball bearings. This not only makes light running possible, but with grooves cut exact to size of balls, all vibration is done away with, the rack being rigid, as the bearing surface is evenly distributed all round the circle, Fig. 5.

The comb is heated by loose steam rim, 4, Fig. 5, pressed close under the circle by means of springs which keep it in constant touch, without being much of a brake. As an accurate fit is not as important as when the steam chest was the sole guide of the rack, a little expansion or contraction makes no difference to the true running of circle.

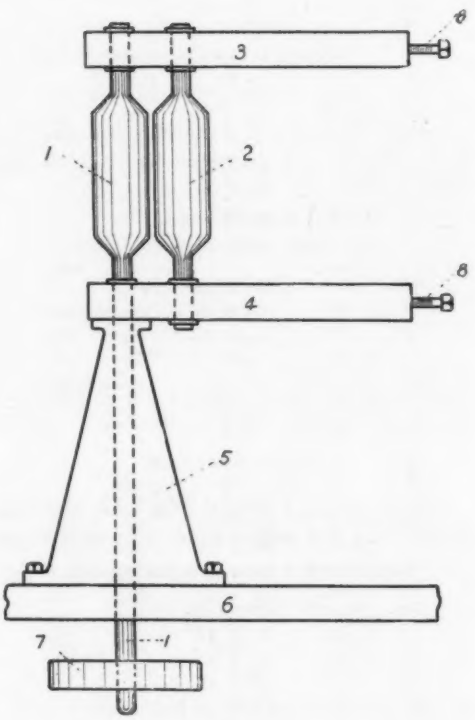


FIG. 6.

ROLLERS.

The wool is drawn out of the comb and made into a sliver by means of perpendicular

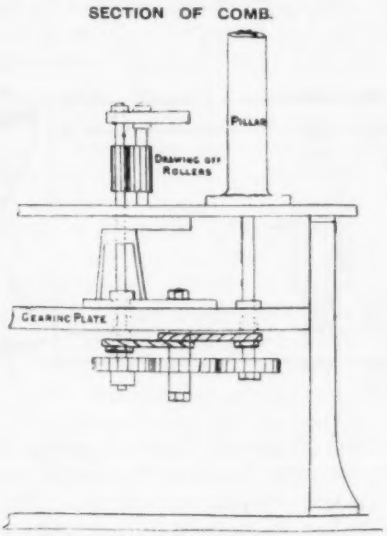


FIG. 7.

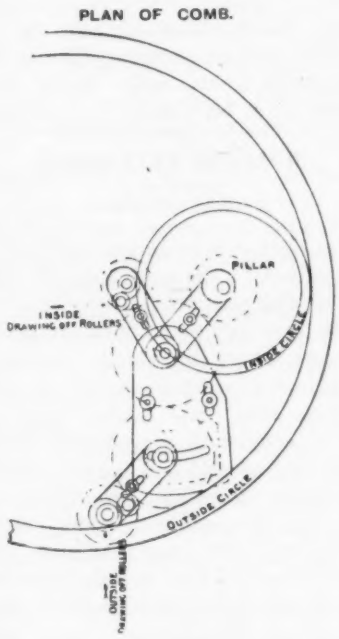


FIG. 7.

rollers, which vary in diameter from 1 to 2 inches, according to the class of wool to be combed. The finer the wool, the less the diameter of the roller and the finer are the corrugations in proportion.

In the older style of machine the steam chest formed the frame to which the roller bracket was fixed. As a result everything was heated, and to make any alterations was an uncomfortable job.

In the newer styles, the rollers are secured to a capstan bearing, which rests on the bed plate, which not only makes a more rigid support, but takes away the danger of bolts coming loose through expansion and contraction, when the comb has for any reason not been working and the steam has been turned off, Fig. 6.

An improvement patented by Whitehead & Layland should be noticed here. It consists of self adjusting gearing links, Fig. 7. It often happens, particularly in recombing processes, that the rollers have to be moved either nearer to or further from the circles. This in the old style meant going under the machine in order to put the wheels properly into gear. The gear links do away with this, as they keep the roller and stud always in the same relative position. To effect a change it is necessary simply to slacken the two bolts in the roller fixings on top of the gearing plate, and the two bolts in the small gearing plate. Then move rollers to position required and tighten bolts. The wheels are properly in gear and the comb is ready for starting.

The roller itself is fluted for about 4 inches of its length for fine wools and 5 inches for long wools. Round flutes are preferable to V flutes as there is less liability to cut the fibre if the wool is damp, also less wear and tear on the leather or sheet with the round flute.

The main roller is better if it is made longer than the press roller in the fluted part. Then if it becomes worn it can be lowered and a fresh working surface is provided without having to renew roller. For long wools it is preferable to have press roller rather larger in diameter than main roller, as it increases the grip.

Various styles of press roller are in use. In Jowell & Sharp's fixed spindle and sleeve boss, Fig. 8, many of the old drawbacks are

done away with, and a saving in leathers, bushes and rollers is effected.

Fig. 8 shows the press roller when in position for working. The fluted part, A, revolves loosely on the fixed spindle, B, which is held stationary by the squared position fitting in a square hole in the bottom bush, C. Recesses to keep waste from collecting at end of boss are formed at D. Fig. 9 shows the roller sections; Fig. 10 the spindle fluted for oiling purposes.

FIG. 8.

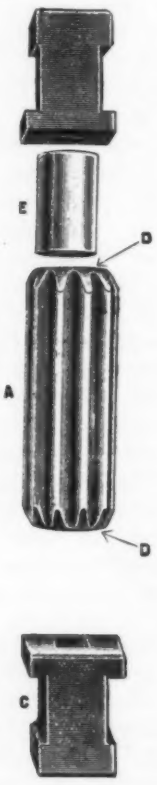


FIG. 9.

FIG. 10.

It is necessary that great care be exercised in putting the weight on rollers, too little weight producing slubby, lumpy work. Too much weight not only unduly wears leathers and rollers but is very liable to cut the wool instead of drawing it.

Springs of equal strength must be used at each end of the roller, and when the rollers are just touching along all their length of the fluting, the weight is best put on by giving an equal number of turns to both top and bottom screws. Some makers put two springs at each end, the object being to get pressure across boss instead of just in the centre, thus preventing tendency of boss to turn round in headstock. This, of course, only applies to the old style of press roller.

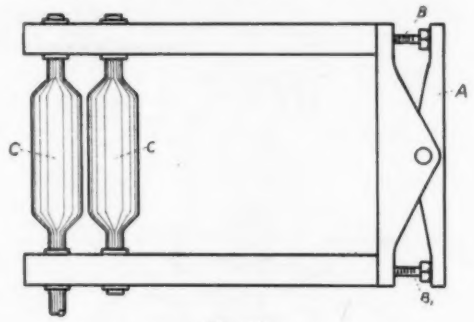


FIG. 11.

Various plans have been proposed for securing evenness of pressure on both ends of roller under varying conditions. The one most in use at present is Leyland's automatic adjusting pressure motor, Fig. 11, which was originally fixed to the rollers of gill boxes, but is now in regular use on the Noble and other combing machines. In fact it adapts itself to any roller where the pressure is put on at both ends of the roller.

ROLLING SELVAGES.

BY C. T. DONLEVY.

A great deal of trouble and damage is frequently caused by the rolling of the selvages in the finishing process. I have had experience with this difficulty, both on plain and twill weaves, where the selvage yarn is drawn in the same harness that carries the regular warp. The worst case I ever came across was with a broadcloth, woven with three harness twill, two up and one down. The goods were tacked in the finishing room before fulling, but still the selvages rolled badly. I tried many ways to overcome the difficulty and finally succeeded by drawing the selvage threads on two separate harnesses, or on a listing motion. The listing motion was run from the first jack on the loom. The chain for this jack was built two up and two down, making a basket weave for the selvage. As the take-up on the basket weave is not so

great as on the regular weave used for the cloth, it was necessary to adopt means to dispose of the surplus selvage yarn. This was done by running the selvage threads from the beam over a small pulley. This pulley was attached to the end of a cord that ran over another pulley fastened in the ceiling. At the other end of the cord a small weight was attached. The selvage threads after passing over the pulley at the end of the cord were carried under the whip roll and then to the selvage heddles.

In order to keep the selvage threads separate they were run between the coils of a spiral spring placed behind the whip roll and fastened to it. This guide worked very well and prevented any tangling or twisting of the threads. As the selvage threads became slack during the process of weaving, owing to the unequal take-up of the selvage and body warp, the surplus was taken up by the weighted cord and pulley. When the pulley reached the ceiling the extra yarn was cut out and the process repeated. In this way the difficulty with rolling selvages was entirely overcome.

FELTED GOODS.

BY N. REISER,

(In Spinnerei, Weberei, and Appretur.)

Felted woolen goods may be either in the form of yarn or fabrics. The first is used for various purposes, such as fringes, from which long threads project, the felting being intended to prevent raveling when the goods are in use. All yarn felting machines are built on the same principle, that of subjecting the yarn to a rubbing process between rollers that vibrate longitudinally and at the same time revolve on their axes as in the case of ordinary condensers on woolen cards. While the yarn is passing between the rollers it is subjected to the action of soap solutions and steam. Felted fabrics are divided into two classes, the ordinary felts and the woven felts.

Ordinary Felts.—These are made either of wool or hair. Soft wool felts are used for upholstery goods, shoes, etc. The wool is first carded, being delivered in the form of a thin web that is wound on an endless apron. Owing to the fibres being laid more or less parallel by the card the resulting felt is stronger lengthways than widthways. To overcome this defect two cards are combined, one laying the fleece crossways and the other lengthways. The carded stock is wound on the endless apron until the required thickness is obtained. This is automatically adjusted by weighing the material before it is carded. Very often cheaper material, such as cotton, noils or shoddy, is introduced into the center of the felt to reduce the cost.

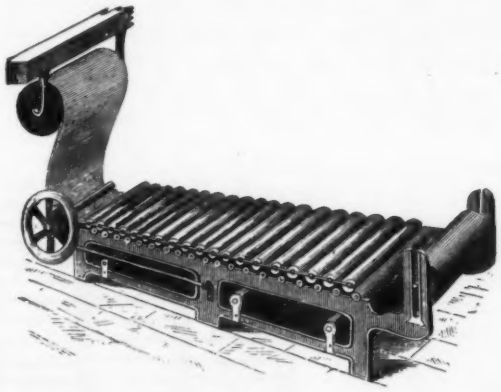


FIG. 1.

When the fleece is finished on the apron it is cut apart and wound on a roll preparatory to felting on the machine shown at Fig. 1. As shown in the illustration, the fleece is passed between the rolls and wound on another roll at the other end of the machine.

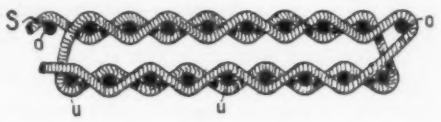


FIG. 2.

The smaller intermediate rolls are set in a frame and vibrate lengthways while revolving on their axes. Before passing between the rollers the felt is saturated with a warm soap solution and is subjected to the action of steam during the felting process. After repeated treatment in this machine the felting process is finished in either a hammer or a rotary fulling mill, after which the felt is washed, dried and finished.

Woven Felts.—These goods correspond with the felts already described only in name as they are made like ordinary woven goods with warp and filling. They are used principally for technical purposes as in paper manufacturing. They are made in both open and endless form; the first has the appearance of the ordinary woven fabric while the latter is woven in the form of a bag. The endless felts may be woven in bag form as shown at Fig. 2, or they may be first woven in open form and then the ends brought together and the projecting threads interlaced so as to form a splicing, which becomes a compact part of the fabric when felted. This splicing is made by raveling the filling for six or eight inches, then fastening each end in a clamp so as to leave the threads of the warp projecting. These ends are then tied together, care being taken to spread the knots. The filling is then drawn in by hand in the case of loose fabrics, or by a long needle where the fabric is more closely woven. When this work is well done the splicing cannot be detected from the body of the felt when finished.

The weave used for woven felts varies with the fabric desired, being sometimes made two or more ply for thick felts. The thick endless felts are usually felted in a hammer fulling mill, but a rotary machine has been built for this purpose.

A FABRIC FOR TOWELS.

The fabric shown in the accompanying illustration has recently been patented in Germany. It is claimed that the construction

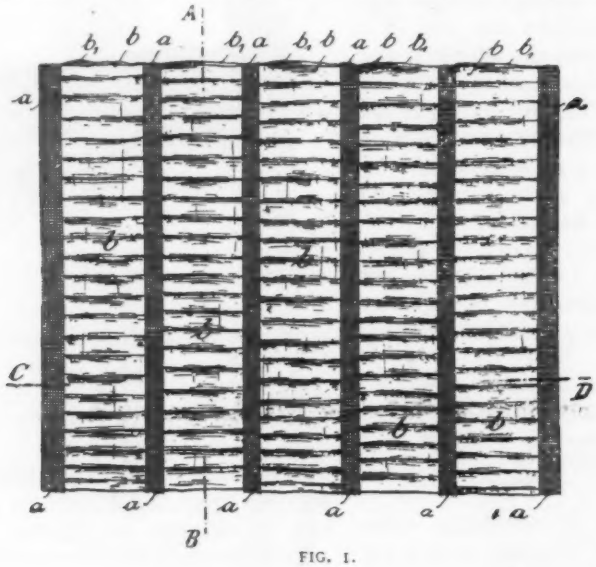


FIG. 1.

FIG. 2.

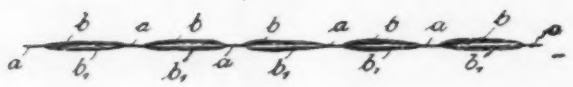


FIG. 3.

is well adapted for toweling owing to its rapid absorption of moisture. The rough surface is also claimed to be superior to that of ordinary towels for rubbing the skin. The cloth is woven with smooth solid stripes, a, running lengthways with the warp. Between these stripes is a double cloth, which is stitched crossways in such a way as to produce a corrugated surface similar to seersucker. In this way a porous and very durable fabric is produced capable of standing a great deal of wear and yet absorb moisture quickly.

Fig. 2 shows a section along the line A-B,

Fig. 1; Fig. 3 shows a cross section along the line C-D, Fig. 1.—Leipziger Monatschrift fuer Textil-Industrie.

ENGLISH NOTES.

(By our Special Correspondent.)

Some informing particulars are just now made public that were obtained in response to a circular issued by the Zurich Silk Industry Co. These relate to silk weaving and show the relative importance of various countries thus:

	Hand looms	Power looms
France	35,000	38,000
Russia	20,000	30,000
United States		40,000
Switzerland	13,000	5,000
Germany	5,000	16,000
Italy	9,000	11,000
Austria	3,000	8,000
Spain	3,000	
Great Britain	1,000	1,500

The table shows that high protection consorts remarkably well with success in the silk trade. It places Russia much higher and Italy much lower, than might have been imagined to be their proper places. America is unique in having no hand looms and Spain in possessing no power machinery. In Switzerland the number of hand looms declined from 30,398 in 1881 to 13,041 in 1904 and the number of loom workers from 26,800 in 1897 to 19,000 in 1904. The decrease meant no decline in employment, for the total of factory workers rose from 5,563 in 1885 to 17,619 in 1904 and to each power loom there is one weaver. From the statistical point of view no reason is apparent why America should take up hand-weaving.

* * *

Our dilettanti are taking up with handweaving and in a 15th century gabled house in ancient Canterbury ladies are duplicating the work of the Flemish weavers. A gauze weighing less than an ounce per square yard is one of their triumphs. Twenty-eight looms are at work on silks, serges and linens, and it is noted that the modest price of the latter is $1.56 a yard. Scarfs, peasant laces and quaintly stitched rustic smocks are also enjoying the patronage of the Arts and Crafts cult.

An Englishman who has been doing well in the superintendence of American tweed and worsted mills praises American management for one cause and disparages it for others. His adverse criticism concerns the prevalence of graft and the worship of mere speed, apart from considerations of no less importance than quickness. What he praises is the organization of the mills and the general excellence of the arrangements for "keeping track" of the shadow of profit. In those respects he agrees that America is in advance of England.

Withal, he has found missing from more than one otherwise admirably equipped mill a book that no Englishman can get along without. This is the lot book, which shows the origin and destination of raw material. On being entered inward each parcel of raw stock receives a distinguishing number that clings to it for the rest of its career. And from the last column in the page one ought to be able to see what became of every pound of the stuff. Without some equivalent provision it would be hard to tell what had been wasted, stolen or spirited away to no good purpose.

* * *

Americans must ask themselves whether they are getting all they should for their wastes. In face of the differences in wool prices on the two sides of the Atlantic, all wool wastes—on the face of things—should be worth more to Americans than to English buyers. This consideration does not affect the consignment of strip cotton for sale in Manchester, or the casual sending of small lots of silk throwster's waste. It does, however, touch the matter of wool noils and quite recently 50,000 pounds of these at 22 1/2 cents have been picked up in Massachusetts for England. Merely as noils they were a bargain to an English buyer. They were the more a bargain because they contained 20-25 per cent. of top worth 46 cents here. What to think of the combing that was answerable for this result, one hardly knows. Perhaps time is unusually valuable in the producing mill, or possibly its success is measured by the yield of noil rather than top. Whichever the case, makers of waste may be counseled to sell carefully.

"Room and power companies" have played their part in developing English textile industry. A company, or an individual, provides a mill and an engine and divides the floors to suit the necessities of tenants who may be numerous in one set of premises. The smallest of manufacturers thus gets some of the advantage of power production on a large scale and the owner gets his profit in rent. The arrangement is commonest in the weaving trade, in which men pay so much for space and so much per loom per annum. Tenement factories abound in Lancashire and are found in many districts, but it is in the lace town of Nottingham that factories are largest and tenants most multitudinous. Our municipalities never forego rates on mill-property, give sites or advance money, but by providing nests those who wish for more employment in the town sometimes succeed in inducing birds to settle.

* * *

A wide stripe is the prime characteristic of the tweeds now selling for men. Intervals of 2 1/2 to 3 inches are common and in most cases these are crossed less distinctly by lines in the other direction. Brown is no longer the dominant tone in the groundwork. More is seen of greys and green mixtures, the latter in rich combinations and no doubt these colorings will have a run. Tailors have been disappointed with the dyeing of many of the brown goods that monopolized attention last winter.

The attention of people with tambouring or sewing machines may be directed to the possibility of making fancy waistcoatings. Stripes of chain-stitch are worked on cloth blankets leaving spaces for pockets, for the collar and a place for the buttons and holes. The pieces then reach the tailor ready for fitting. Working on this principle a large assortment of colorings and styles are available at moderate prices.

* * *

Knitted linen undergarments, preferably unbleached, are to be found in the good outfitters' shops. As their durability has proved less than was expected at the somewhat high prices charged, mixture of flax with ramie and with maco fibre are employed. In cheaper makes a thread of cotton, to form the inside, is knitted with a thread of flax and this is supposed to make the garments specially absorbent.

An increasing number of people are turning from the belief that wool must be worn next the skin and this extends the opening for cottons. The cottons and linens must be cellular whether knitted or woven and their sale here is assisted by neat stripings of color or silk. Cellular cloths are invested with special virtues by theorists on clothing and makes are being advertised under fancy names.

* * *

In view of America's new interest in China it is worth recording that German manufacturers of cotton prints have come to the conclusion that an opening in the East is indispensable to the welfare of the German industry. Means to break into the market are being devised and at a meeting called to consider the subject, proposals to send a commercial expedition and to found a permanent exhibition of German patterns were both rejected as insufficient. These are expedients dear to the heart of consular reporters and they are recommended to others on the strength of their employment by German sellers. Here is some evidence that these systems of approach are not so satisfactory as may have seemed.

* * *

A sort of flannel much used for good underwear and blouses is advertised under more than one fancy name and is giving satisfaction. Woven designs and printed ones are both employed, and the fabrics wear and look well and do not shrink. The last named characteristic is due to the employment of just such a proportion of cotton as prevents shrinkage. Soft cotton and short merino are mixed in almost equal quantities and are spun to high counts and then closely woven. For shirtings, stripes of heavier solid cotton are used to lend stability to some qualities. In a word, makers are applying to good and costly materials, processes that have usually been followed for cheapness and to support low material.

THE AMERICAN COTTON BALE.

BY BENJ. RICHARDS, Representing the Underwriters' Bureau of New England.

(A paper read at the International Conference of Cotton Growers and Manufacturers at Washington.)

It is the purpose of this paper to point out briefly the excessive waste in loss by fire caused by the poor manner of baling and handling the present American cotton crop.

The statistics, as given in the Chronicle Fire Tables, show that fire losses in raw cotton alone, not including cotton in gin houses and mills nor the damage to the building in which the cotton was stored, for the nineteen years preceding 1903 amounted to over twenty-one millions of dollars, 85 per cent. of which was covered by insurance. Of this yearly, million dollar tax, 63 per cent. was loss on cotton in warehouses, the remaining 37 per cent. being about equally divided between the losses on cotton in transit and that awaiting shipment on wharves and platforms.

The warehouse fires, which comprised the 63 per cent., averaged about $20,000 each; and on wharves and platforms and in transit about $5,000 each. Roughly speaking, the fire loss alone is three-tenths of a mill per pound on the American cotton crop while awaiting and during shipment.

To this actual loss, we should add the great damage to other property from fires originating in cotton, the most notable instance of which is the four and a half million dollar fire at the Hoboken docks in the summer of 1900, which originated from sparks in a bale of cotton.

CAUSES OF FIRE.

A brief review of the causes of the fires in raw cotton shows the following surprising results:

Excluding all fires caused by exposure to other fires, of the causes reported, 50 per cent. of the fires in cotton in transit and awaiting shipment were caused by sparks from locomotives.

Other sparks caused 19 per cent. more. In other words, sparks alone were responsible for over two-thirds of all the fires in raw cotton during and awaiting shipment. Of the remaining fires 11 per cent. were incendiary, 6 per cent. were caused by cigar stubs and 5 per cent. by the misuse of matches. The familiar scapegoat, "spontaneous combustion," is charged with causing 6 per cent. of the fires.

Of the fires within cotton warehouses, 21 per cent. were reported as being caused by sparks, half of which were from locomotives. The usual 5 per cent. can be charged to cigar stubs and 10 per cent. to matches, while "spontaneous combustion" is claimed to be responsible for 16 per cent. Further on we will endeavor to show that a portion of these spontaneous combustion fires, as well as those of the 30 per cent. of fires whose cause is unknown, could more properly be charged to some of the other causes mentioned. Therefore approximately 75 per cent. of the cotton fires are from causes that are well known, may be easily avoided, and to which other merchandise, if exposed in a similar manner, is not subjected to such a heavy loss by fire. The source of this proportionately excessive fire tax can be traced to the poor manner in which our cotton bales are prepared for shipment.

One objection to the American bale from the fire protection standpoint is its poor covering. With a closely woven and untorn burlap covering it is probable that practically all of the fires from sparks would be avoided. There would be no droppings from the bale and therefore wharves, platforms, and warehouses could be kept clean and free from loose cotton lying about.

Fire flashes rapidly over an ordinary pile of American compress bales in a storehouse as a result of this loose cotton protruding, thus gaining extent beyond easy control. This will not occur in storage of Egyptian, Indian or cylindrical bales.

The other great needed improvement is in the baling at the compress. Were the bales properly packed before shipment, even with the present covering, there would be less damage from fire. A large part of the unknown and spontaneous combustion fires are doubtless the result of the present method of packing. The bale is greatly compressed in baling, but is not fastened sufficiently to maintain the maximum amount of compression, therefore when released from the press

the bale expands. This makes the bale like a sponge in the hand; when pressure is released it sucks in air, the result being that the bale contains channels of breathing holes and passages from its surface inward, which have been formed by the in-rushing air. The spark falls on loose cotton protruding from the bale and at once buries itself into the bale by following these air passages. There it lies unseen and the small hole where it entered, often not larger than a pencil, is readily overlooked or becomes obliterated as the bale is handled. The bale may then be put into a vessel or warehouse. The fire feeds on the cotton and air and gradually burrows out a hollow inside the bale from which it burns outward, finally gaining sufficient heat to flash up, resulting in a fire that we find very convenient to classify as an unknown or spontaneous combustion fire. This action was observed by conducting tests on a few small bales made by packing cotton tightly in a box by means of a dull chisel and mallet and binding it together with wires. When the box was broken away the miniature bale expanded in like manner to a compress bale. The cotton was ignited by touching the glowing end of a piece of burning twine to the side of the bale. In a few moments nothing but a black spot was seen and the spark had apparently gone out, but after awhile smoke would come out all around the bale, increasing until finally charred spots would appear on all sides. The fire would often go out before consuming the entire bale, thus leaving the cotton in the form of a hollow shell, the fire having eaten out the inside completely.

As, in baling American cotton, the surfaces of the bale to which the pressure was applied in the compress, are of much greater area than the other surfaces, there is a constant tendency for the bale to expand to an oval form, thus the absorption of air goes on continually until it is opened at the mill. This probably accounts to some extent for the rapidity with which sparks are taken in by the cotton bale.

It is without doubt probable that 70 per cent. of the fires in American cotton could be avoided were it baled as well as the Egyptian and Indian cotton.

We find practically no inherent fires in Indian or Egyptian cotton from the aforementioned causes. The condition of the bale on reaching the mill is usually entirely satisfactory. Mr. Robert P. Skinner, Consul-General at Marseilles, in his report on Indian cotton as recently printed in the Textile World Record states: "A foreman on the docks with whom I discussed this question told me that a lighted match might be thrown upon an Indian bale without much fear that the bale itself would be damaged, and that the workingmen who are in the habit of smoking a great deal were under no special instructions as regard sparks and matches when handling Indian cotton. On the other hand when American cotton arrived, the most minute precautions were necessary to prevent accidents." Also he says in another place, quoting a Liverpool compress manufacturer, "No instance of a cotton fire on board ship or in a warehouse has been known with these Indian-pressed bales, whereas fires are of constant occurrence with American bales."

The present cylindrical bale as marketed by the American Cotton Co. is also fairly satisfactory. A committee of the National Fire Protection Association, of which Charles A. Hexamer was chairman, made tests on cotton bales in 1902 and found this bale "Not subject to a flash fire," and also that it could not be burned when set on fire on either end. When the bale is ignited on the side, however, the fire will spread quite rapidly. The Lowry bale, which formerly was in use to some extent, behaved exactly in reverse of this; a fire started on its side would not spread, but one started on the end would follow the coils and consume the whole bale.

The greater the density in a cotton bale the less it is subject to damage by either fire or water. In the tests here mentioned the salvage from the fire test was about 71 per cent. on the cylindrical bale against 65 per cent. on the compressed and 50 per cent. on gin bales. The density of the bales was thirty-five pounds, twenty-two pounds and twelve pounds per cubic foot respectively. In an immersion test of forty-eight hours each, the gin bale absorbed over two hundred per cent. of water, the compress bale over 162 per cent., while the American bale with its

greater density absorbed but 35 per cent.

It will be observed that the compress bale used in the test was somewhat more dense than the average. These bales as received at New England mills often run as low as fifteen pounds per cubic foot.

Wet and fire-damaged cotton must be opened out and rehandled practically a handful at a time. Often it cannot be used in the mill on account of stains and must be sold for other purposes.

In reducing the loss by fire the fire protection engineer naturally first turns his attention toward eliminating, as far as possible, the elements which cause the fires. We cannot prevent locomotives, chimneys and people who smoke from throwing fire about promiscuously. We can usually, however, protect our goods against these well-known and common exposures, but in the case of the American cotton bale the cause is practically beyond the influence of the underwriter. He sees the crime but cannot lay hands on the culprit. He must insure the cotton as he finds it, sparks and all. One way to do this is to make a rate and trust to good fortune. A better way and the one to which we are giving our attention, is to try in some measure to counteract the danger from fire caused by poor baling by applying improved methods of storage and by modern fire protection.

Although it is not the purpose to mention here all the possible saving in improving the cotton bale, a few matters relating especially to insurance will be considered. In recent years the amount of cotton kept on hand by the average mill has greatly increased. It is not uncommon now for nearly a year's supply of cotton to be purchased at one time and stored in the mill yard. This has meant a great increase in the number and size of storehouses. The insurance companies have usually asked that cotton be stored separately from other goods. Had the cotton a density of thirty or forty pounds per cubic foot, as has Egyptian or Indian, instead of about half that, as at present, the cost of storehouses would be decreased proportionately and therefore the insurance on them would be less.

In order to reduce the losses as much as possible the underwriters have been compelled to ask that the values per fire section be kept low and therefore the present standard type of cotton house with wooden sides and brick fire walls dividing it into sections has been developed. This type of building costs forty to fifty cents per superficial foot, and a material saving would therefore be possible were the cotton compressed to twice its present density. Moreover many mills have been put to the expense of equipping their storehouses with automatic sprinklers in order to save on cost of insurance. As the buildings are not heated the sprinkler equipment is considerably more costly than an ordinary sprinkler system, as a special automatic dry pipe valve must be used to keep air pressure in and the water out of the pipes until a fire occurs.

We do not wish to appear as discouraging sprinklers in cotton houses and we do not say that sprinklers would not have been required if the cotton bales were all similar to the Egyptian and Indian bales, but the loss by fire would certainly be less and therefore also cost of insurance.

This is also true of marine insurance. A large underwriting house in New York that makes a specialty of cotton states in a recent letter that other things being equal, "the marine rate would be much in favor of Egyptian cotton on account of the superior baling of this article."

We realize the difficulties to be met before improvement in the present bale can be made. Doubtless under the present system of sampling the underwriter must be contented with a somewhat ragged bale. There is no doubt, however, of the benefits to be obtained by a greater density in the bale. The Egyptian and Indian cottons are a better insurance proposition than grey print cloths in bales and we hope to see the American bales raised to the same level. Of course with greater compression the underwriters will probably have to cope with larger amounts of loose cotton in the opening rooms of the mills, but this danger can be easily guarded and is more than offset by the reduction in the number of fires we could expect under the improved methods of baling

We trust that in considering any plans for the betterment of marketing American cot-

ton the matter of loss by fire will be given proper attention. It is perhaps needless to state that modern fire prevention devices should be installed in all large gin houses and ware houses throughout the South and special care given to prevent any oils or other foreign matter being baled up in the cotton. Then with a density of forty pounds per cubic foot in the bale and a covering that will shed sparks we could look for a material reduction not only on the million a year loss on cotton passing between the compress and the mill, but on the fire tax on all American cotton wherever handled throughout the world.

A SEAMLESS BAG.

A method of making seamless bags, invented by Kashichi Sano, of Tokio, Japan, is illustrated by Figs. 1 to 5. The object is to make a bag that can be used with either side out. The bag when completed consists of two thicknesses of cloth.

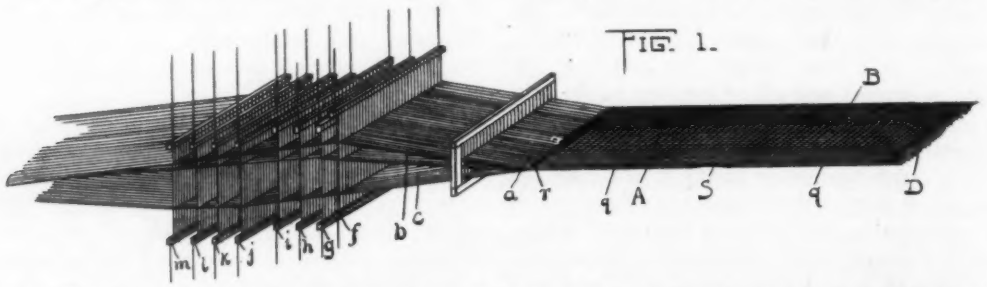


FIG. 1.

Fig. 1 is a perspective view showing the bag in process of weaving. Fig. 2 is a perspective view of a section of the fabric from which a bag is made. Figs. 3 and 4 are similar views showing the process of manipulating the fabric to produce the bag shown in Fig. 4. Fig. 5 is a diagrammatic view illustrating the shuttle movements to produce the fabric.

The warp is divided by six heddles, f g h, and j k l. Of these, four—for instance, f g j k —are arranged so as to weave a double or tubular fabric from the warp, a, which, for this purpose, is separated into the upper warp, b, and the lower warp, c. Two other heddles, h and l, are for the purpose of weaving a single fabric from the warp, a. In addition to the heddles above named other heddles—for instance, i and m,—may be used in order to form any desired design on the fabric or bag.

A single fabric, D, of suitable length is first woven to form the bottom of the bag. A tubular fabric, A, B, is next woven to form the body or sides of the bag. The fabric, A, B, is woven to desired length and then an opening, s, is formed in the fabric in the process of weaving. A length, A, of single cloth is now woven to correspond with the length, B. Next the loom is operated to make a single fabric, C. From this point the operations, as described above, are repeated in succession until the warp is exhausted. By this means a continuous fabric is produced in which there are single fabric portions and tubular portions alternating in succession with the opening, s, at an intermediate point of the tubular portions.

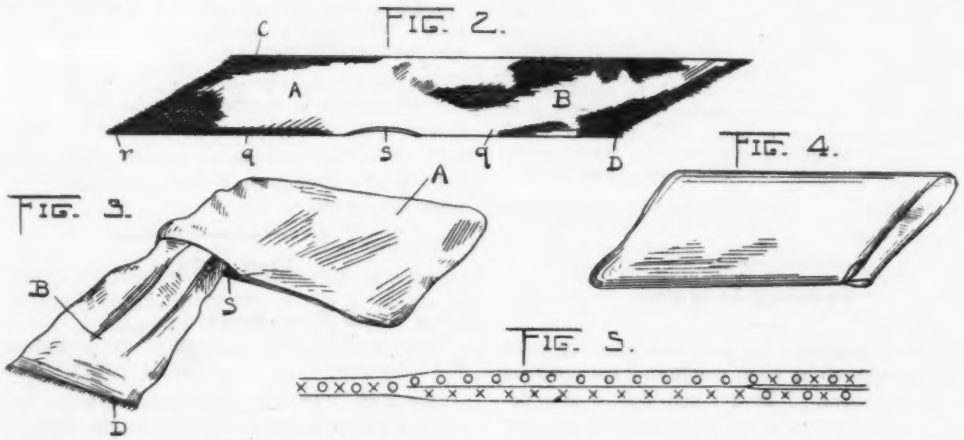
Fig. 5 shows, by means of circles and crosses, the shuttle movements distinguishing the "let in" and "let out" of the shuttle or weft. The portion of the fabric shown in Fig. 5 corresponds to the portions, r, q and s in Fig. 2.

By referring to Fig. 5 at the portion marked (r) the fabric is shown single or flat, the appropriate heddles being adjusted to give this result. The crosses in Fig. 5 are, for the purposes of this description, assumed to indicate the weft-threads laid by the shuttle in its motion away from the operator and the circles to represent the weft-threads laid by the shuttle in its movement toward the operator.

The portion of Fig. 5 indicated by (q) is the part woven tubular. Upon referring to this figure it will be noted that the shuttle passes from the operator through the warp forming the lower ply of the fabric and approaches the operator through the warp forming the upper ply of the fabric, thus

forming a seamless tube. In the portion marked (s) which indicates the opening, the shuttle passes from the operator through the warp forming the upper ply of the fabric, then toward the operator through the warp forming the lower ply of the fabric, then returns through the warp forming the lower ply of the fabric, and again approaches the operator through the warp forming the upper ply of the fabric, and so on until a length of fabric is thus woven to form the opening, s, of the length desired. This results in selvage edges for the openings, s, as will be readily understood.

The next operation is to cut the fabric into lengths between two consecutive single-fabric portions, C and D. Fig. 2 illustrates one of the sections or lengths of the fabric so cut off. It will be seen that each section is of single fabric at each end with the tubular body or intermediate portion, the opening, s, being practically midway between the single fabric or closed end portions.



In order to form the bag from one of the sections illustrated in Fig. 2, the portion, A, of the fabric between the opening, s, and one end, say C, is turned inside out. This may be done by inserting the hand through the opening, s, grasping the end portion, C, and pulling it out through the opening. The result of this operation is illustrated in Fig. 3, the portion, A, having been turned inside out. Next the portion, B, is pulled inwardly through the opening and passed inside the portion, A. This produces such a bag as is shown at Fig. 4. This bag is seamless throughout, the sides or bottom being homogeneous with the body or sides of the bag. The bag, it will be seen is doubled and may be reversed, that is, the inside and outside portions interchanged. This reversing may be done by returning the fabric to the condition shown in Fig. 2 and then pulling the closed end portion, D, through the opening and proceeding as before.

By referring to Fig. 4 it will be seen that a drawstring may be inserted through the opening, s, by which the bag may be closed and tied. By referring to Figs. 3 and 4 it will be noted that when the bag is reversed the face side of the fabric forms the outer and inner surfaces of the bag and the raw surfaces and the unfinished edges made by cutting across the single fabric portions, c and d, are within the double walls and bottom of the bag and concealed. This makes a bag having finished outer and inner surfaces.

The conditions of the British carpet trade with the United States have completely altered within comparatively recent times. Up to 1874 it was the chief market; in 1902 less than 3 per cent. of these goods went to the United States. In addition to this actual curtailing of trade there has been a loss, which it is impossible to estimate, due to the emigration of British capital and British firms and British labor.—British Tariff Commission.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Standard Wage List.

Editor Textile World Record:

Has a system for adjusting weaver's wages on fancy colored cotton goods ever been put in operation in this country or abroad? If so please describe it. I am a boss weaver in a fancy cotton mill and have been led to make the above inquiries by studying the sliding scale at Fall River. I can understand how a system could be devised for standard plain goods like print cloth, but the complications arising in a fancy mill make it much more difficult to get up a system for fancy goods.

Ben Geheimniss (696).

This question is answered by an article in another part of this issue.

Twisting-In Warps.

This is a question that each manufacturer must decide for himself as local conditions are involved to a large extent. I have found that it is a decided economy to twist-in, as we use the Draper stop motion and it means a saving of about twelve cents a thousand ends to renew the warp by twisting it.

Dan Ready.

Calculating the Yarn Count.

Editor Textile World Record:

Please explain the method of calculating the yarn count from the length in inches and the weight in grains of a given quantity of yarn. For example. What is the count of cotton yarn of which 96 inches weighs 2 grains?

P. V. Blyme (692).

The cotton count indicates the number of 4.32-inch lengths per grain (840-yard lengths per pound). If 96 inches weigh 2 grains, there are 48 inches per grain. The cotton count is, consequently, 48 (inches) ÷ 4.32 (inches) = 11 1/9. The cotton count is easily reduced to any other basis desired. Thus:

Runs = Cotton No. × .5¼.
Worsted No. = Cotton No. × 1½.
Linen No. = Cotton No. × 2.8.

Twine for Jacquards.

Editor Textile World Record:

I wish to thank you, Mr. Henry Owen, and the others who have kindly replied to my inquiry in your May issue in regard to a twine for jacquards. I will add that the 9/30s linen lingo twine has been used for border harnesses on jacquard damask weaving and is not twisting up or giving any trouble to the weaver. It was varnished from the neck cords down to the lingoes in our usual way and is working all right.

Butler.

Numbering Artificial Silk.

Editor Textile World Record:

What system of numbering is used for artificial silk? What is the average size of the artificial silk used in this country?

Henry Emery (690).

Artificial silk is numbered by the dram and the denier systems the same as is used for natural silk. The most common size of artificial silk used in this country is 8 dram, corresponding to about 140 deniers.

Electric Tape.

Editor Textile World Record:

What kind of cloth is used in the manufacture of electric tape?

Spring Garden (673).

Our New York correspondent, who is trading in these goods, sends us a sample of the cloth used for electric tape, which he says is sold at 10 1/2 cents per yard, 36 inches wide. An analysis of this cloth gives the following results:

Weight, 5 5/6 yards, 36 inches wide per pound.
Warp, 107 threads per inch, 49s cotton.
Filling, 91 threads per inch, 51s cotton.
Weighting, none.

Bleaching Powder on Cotton.

Editor Textile World Record:

How should bleached cotton that smells of chlorinated lime be treated to make it serviceable to be mixed with wool?

Canadian (697).

With weak hydrochloric acid. The odor is of the chlorine, but a little lime is sure to be present in the fibre. The acid converts the lime into the highly soluble salt, calcium chloride. Avoid the use of sulphuric acid, which will precipitate calcium sulphate (gypsum) on the fibre and during scouring will be likely to form a lime soap that no means will remove from the fabric.

Romulus.

Number of Watchmen Required.

Editor Textile World Record:

How many watchmen are required for a mill employing 1,500 hands? Etikett (687).

The number of hands in a mill does not furnish any reliable standard to determine the number of watchmen required. The number of watchmen depends upon the territory to be covered. This varies widely in different mills according to the arrangement of the buildings. We know of one mill where the watchman's route is three-quarters of a mile long and he is required to cover this every hour. The watchman in some mills has other duties than that of watching the mill, such as attending to the boilers, etc. This adds another element to the problem and makes it necessary to know the conditions before a satisfactory answer to the question can be given.

Calculating the Loom Weight of Woolen Goods.

Editor Textile World Record:

I would like to have you publish directions for calculating the loom weight of woolen goods required for a given finished weight per yard.
Benedick (688).

The difference between the woven and finished weight per yard of woolen goods is due to the change in length (usually a gain) and loss in weight. To determine the woven weight per yard required for a given finished weight it is, consequently, necessary to know the percentage of shrinkage or stretch in length and of loss in weight during the finishing process. The calculation can be best explained by an example taken from actual mill practice:

Ex. Ten cuts of a piece dyed worsted serge when woven measured 420 yards, and weighed 577 pounds, or 22 ounces per yard; when finished these ten cuts measured 399 yards, and weighed 510½ pounds, or 20½ ounces per yard. Then:

399 (finished length) ÷ 420 (woven length) = 95 per cent., yield in length.

100 (%) — 95 (%) = 5 per cent., shrinkage in length.

510½ (finished weight) ÷ 577 (woven weight) = 88½ per cent., yield in weight.

100 (%) — 88½ (%) = 11½ per cent., shrinkage in weight.

We now have the woven ounces (22), the finished ounces (20½), the yield in length (95 per cent.), and the yield in weight (88½ per cent.). Any one of these four factors can be calculated from the other three, the operations being as follows:

1. (Yield in length × finished ozs.) ÷ woven ozs. = yield in weight. (.95 × 20½) ÷ 22 = 88½ per cent.

2. (Yield in weight × woven ozs.) ÷ finished ozs. = yield in length. (.88½ × 22) ÷ 20½ = 95 per cent.

3. (Yield in length × finished ozs.) ÷ yield in weight = woven ozs. (.95 × 20½) ÷ .88½ = 22 ozs.

4. (Yield in weight × woven ozs.) ÷ yield in length = finished ozs. (.88½ × 22) ÷ .95 = 20½ ozs.

The answer to Benedick's question is supplied by formula 3. Here it is applied to a kersey fabric:

Ex. A woolen kersey is made of stock shrinking 22 per cent. in weight in finishing. It is desired to shrink the goods 9 per cent. in length and have them weigh 24 ounces per yard when finished. What loom weight per yard is necessary?

(.91 × 24) ÷ .78 = 28 ozs., per woven yard.

Changes in Wages by Percentage.

Editor Textile World Record:

When my wages were reduced 2.48 cents from 19.8 cents to 17.32 cents per cut in July, 1904, it was stated that the reduction amounted to 12 1/2 per cent. Now when they are raised 1.8 cents from 18 cents to 19.8 cents it is stated that the increase amounts to 14 per cent. Will you explain the matter to me? Fall River Weaver (698).

When expressing a quantity by percentage a base is selected and considered 100. The percentage is the number of hundredths represented by the quantity thus expressed. The smaller the base the larger the percentage. Sixteen is 50 per cent. of 32, because, if we consider 32, the base, as 100, then 16 represents 50 of these hundredths. On the other hand 16 is but 25 per cent of 64 because it represents but 25 hundredths of the base 64.

In the case of the wages in Fall River the reduction of 2.48 cents is 12 1/2 hundredths or per cent. of 19.80 cents, consequently the reduction in 1904 amounted to 12 1/2 per cent. of the former rate. In restoring this 2.48 cents the percentage is based on 17.32, a smaller number, and consequently the increase of 2.48 cents is 14.3 per cent. or hundredths of 17.32. The difference is only apparent and arises from the use of different bases. As a matter of fact the increase of 2.48 was made at two dates. The first increase of .68 cent brought the rate to 18 cents per cut, and amounts to 3.9 per cent. of 17.32. The next increase was 1.8 cents per cut, bringing the rate to 19.8 cents, and was 10 per cent. of 18 cents or 10.4 per cent. of 17.32.

Handling Sized Warps.

Editor Textile World Record:

How should heavily sized warps be handled to prevent them sticking together?

Morton (678).

If the warps are run slowly over the slasher and thoroughly dried, and separated on the slasher with the proper amount of softener, there will be very little trouble with sticking together in the weave room. I have used warps sized as high as 25 per cent. in this way. Clinton.

Warps can be prevented from sticking together by using a 1 1/2 inch back lease and putting soapstone on the warp. Morgan.

The yarn should be dried before it is run on the beam; the slasher should be sure and the leases put in right, otherwise the ends will stick together. On heavily sized warps the leases should be put in after doffing every beam. If there should be a smash, for instance a few threads broken out, the lease should be put in or they will stick. It is probable that the difficulty lies in the leases when the warps are run on the beam. Howard.

The yarn should be passed to the cylinder of the slasher when a high percentage of size is applied. The steam pressure should be from 10 to 15 pounds for coarse yarn, or when a large number of ends are being run for the warp, and also when the slasher is run at a high speed. Fine yarn with the same size and the same number of ends, say 2000 or more, requires a lower pressure; 5 to 10 pounds is used, with 8 pounds as the average. The brushes under the slasher are circular, covered with a good grade of long bristle, and come in contact with the damp warp immediately after leaving the size roll in the box. By rotating at a suitable speed they improve the feel and appearance of the sized warps, especially fine yarns or colored work, where a distinct weave effect is required in the fabric. The slasher cylinder should be kept clean at all times, and when stopped at night the size rolls and squeeze rolls should be washed down with cold water, the immersion roll raised out of the size box, the squeeze rolls taken from contact with the size rolls and the steam shut off the cylinder. The comb at the front of the slasher should have from 7 to 11 dents per inch.

The separating rods play an important part in preventing the yarn sticking together, they divide the warp into as many sheets as there are section beams in the creel, and as the warp passes through the expansion comb it divides the ends into 300 to 500 groups of ends with the group in each dent consisting of one end from each section beam, and not more than two threads should be put in one dent If these suggestions are carried out there will be no trouble with the yarn sticking together and it will make a good yarn to weave.

Henry Owen.

There are several ways to treat sized warps according to how heavy the size is put on. One method is to have the back lease rod about three times the diameter of the ordinary lease rod, and this is all that is necessary unless the size has been laid on extra thick. By increasing the size of the lease rod the yarn is separated before it gets close to the rod and thus prevents its bunching as it would do if only an ordinary lease rod were used. With a small rod the point where the yarn begins to separate is so close to the lease rod that it will bunch up close to the rod and break out. With the large rod the point of separation is farther away.

Another method is to have two flat lease rods fastened together by spring hinges and used for the back rod instead of the ordinary round one. With the working of the harnesses these two rods open and close and the yarn is thus separated as it comes from the beam.

For very heavily sized warps it is well to use an extra lease rod in the same lease as the back rod. This extra one is attached to the lay with a wire and to the whip roller with a spring so that the rod moves forward and back with the lay and keeps the yarn well separated. Dan Ready.

Marketing Tapestries.

Editor Textile World Record:

I am planning to start the manufacture of light weight tapestries and similar goods, and wish you would advise me regarding the best methods of marketing the product. Carson (671).

The principal manufacturers of tapestry goods are organized into what is known as the Tapestry Manufacturers' Association. They agree as to terms, but each has a separate selling force and a separate New York office. The New York selling agent is allowed a certain percentage, from which he has to pay the expenses of the office, maintain men on the road, and dispose of the product of the mill. Robert Lewis is the president of the Association and markets his goods as outlined above, but there is no hard and fast rule.

The Philadelphia Tapestry Mills maintain a New York office, but the road men are sent out from Philadelphia. Special terms are made for fall and spring seasons; that is, goods bought after August 1, are dated as October 10, and after January 1, as March 10, but at other times goods are charged up as 6/10 the following month after the goods are bought. Knickerbocker.

Cut Marks.

Editor Textile World Record:

Can you give me a method for cut marks on black or colored goods? Wagram (676).

Most of our colored goods are prepared on what are called Yorkshire dressing frames, and the spinner when making the warps links a portion of the warp at each required cut length, in order that the warp dresser can mark the yarn, and when these link places come forward the weaver knows when the cut is finished. In black goods we invariably use white selvages and the dresser always marks a portion of the selvage as well as the other yarn. Whenever we put any colored warps through the slasher we mark them red in the usual way, and before delivering them to the finisher we stamp them with the loom number, style and length. Colored goods are stamped red, and grey goods black. We use tar for the black with plenty of dryer, so that the mark soon dries and does not make any impression on any goods it may come in contact with. The stamping is placed about nine inches from the end of the piece to enable the finisher to stitch the pieces together without any interference with the stamping. If any question arises as to quality, length, etc., it can easily be traced. Slashing machines are fitted with a marking motion and when used will ensure a fairly uniform length of pieces, the only variation being caused by the various tensions in the loom.

J. R. Greaves.

Of course a good dye is necessary to make the mark and it should not be difficult to find a responsible manufacturer of dyestuffs. On the white goods we are making just now we use a red mark on one slasher and a blue one on the other. The blue dye is Cotton Blue 4½, and the red is Fast Red R. Both these dyes can be obtained of Kuttroff, Pickhardt & Co.; they are fast colors and give good satisfaction.

To prevent unequal lengths of cuts I think it is a good plan to have the cut marker placed at the back of the cylinder of the slasher, so that the mark will be perfectly dry before it is delivered to the beam. Some slashers have the cut marker in front of the comb, the consequence being that the mark is delivered to the beam wet and so leaves an impression on the next lap. I have even seen this impression six yards away from the real mark. This of course gives the weaver a chance to cut off his piece before the real mark comes in sight and when spoken to about it he generally pleads ignorance.

On colored work I should think any color would be suitable that is in contrast to the warp. I should have the cut lap made so that it will leave no impression on the next lap on the warp, then if the cut marker is working right there should be no great disparity in the lengths of the pieces. There is always the chance for tricky weavers imitating the cut mark so to get off their piece in time for booking up. It is only by constant watching that this evil is reduced to a minimum.

Dan Ready.

Wogram does not say whether he uses the short or long chain system of warping. If he uses the short chain, which is somewhat out of date, the only way to make a mark is to use a string the length required and tie the chain at that point; then when the yarn is dyed it will leave a white mark. All colored work that I have done has had just an ordinary cut mark made with a dauber on the slasher; on black warps it is usually a red mark I have found that any dye that is in contrast to the ground work will be suitable for a cut mark. An overseer of weaving in one of our large mills tells me that in all their colored work they use a white selvage and usually put the cut mark there, in which case any color would do. He also said that he never had any trouble from unequal lengths except when the slasher tender had let the cut marker run dry or where it was not working right.

Dan Ready.

Crepe Dress Goods.

Editor Textile World Record:

I would like to have some information regarding crepe dress goods, prices, fabric, etc.

Monterey (699).

Samples of two of the best known wool crepe dress fabrics have been forwarded to our correspondent. One of them is made by the Atlantic Mills and sold by their agents, A. D. Juilliard & Co., 44 inches wide at 55 cents. The other is a sample of wool "crepeline" made by the Pacific Mills, and sold by Lawrence & Co., at 55 cents, 6/10/60. Until recently the Atlantic Mills made a crepe de Paris, consisting of silk and wool and which they sold for 47 1/2 cents, but we are informed that they have discontinued making it.

Soft Twine and Cable Cord Harness.

Editor Textile World Record:

Which will last the longer, a soft twine or a cable cord harness? Chatham (681).

A soft twine harness should last from three to six years on high speed, but of course a few may break during that time, say from three to ten per cent. A cable cord harness will last from eight to ten years on high speed, say, from 150 to 200 picks per minute. Henry Owen.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 236 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

Knit underwear buyers have been actively engaged in placing spring orders during the past month and salesmen report there was never a time when it was such an easy matter to sell spring goods as at present.

At this writing several lines have been withdrawn from sale, the manufacturers passing the word that they are all sold up. The probabilities are, however, that a number of these who have withdrawn their samples have not sold all they could produce for the season, but rather all that they cared to under present conditions.

Notwithstanding the fact that buyers have placed orders more freely than ever, very little attempt has been made to advance the opening prices. This may be explained by the fact that the opening prices are in a great many instances about the limit that jobbers will pay for goods to sell at popular prices. However, some manufacturers have asked and obtained advances of about 2 1/2 per cent. during the past week. Manufacturers appear confident that there will be no reduction in prices of made up goods, although there may be a decline in raw material. They state that, owing to the extremely well sold up condition of the market and the fact that prices already made are so close, they will take advantage of any drop to increase their profit which they are entitled to. How successful they would be in doing this remains to be seen.

Most lines of men's low grade ribbed goods are in a well sold up condition and many have been withdrawn from sale. We refer to goods from $1.90 to $3.00.

Balbriggans were not open in the regular way until June 5th, but orders on these lines have been taken more quickly than on ribbed goods and today there are scarcely any flat goods available under $2.00.

Stained combed peelers at $3.37 1/2 to $3.62 1/2 have also been in very active demand and a number of the lines are now out of the market, so that today $3.75 is about as low as any quantity of these goods may be had.

The Canasawacta Knitting Co. opened their line of balbriggans and ribs with double seated drawers at $1.90, but advanced them to $1.95 and are now sold up entirely.

The Morris Mills sold up their line of ribbed goods which they make in ecru, blue, salmon and tan with double seated drawers at $1.95. It is understood that a good share of this production was sold in a day or two by wire.

Robert MacKinnon & Co. are offering a line of 4 1/4 pound balbriggans at $1.85, shirts made with hem tail and drawers with single seats with an advance of 10c. per dozen for rib tails and double seats. They also show a line of five pound goods at $2.00 and $2.10; also Oxford mixed and bleaches at $2.00, on which it is reported they have booked a heavy business.

The Oneita Knitting Co. have practically sold up their line of 4 1/2 pound balbriggans with a double seated drawer at $1.95 and also report a large business on 5 3/4 pound stained garment with sewed on rib tail and strap back drawer at $2.75.

These people are offering their line of fine gauge ribbed goods in blue, ecru, salmon and white sold last season at $3.25, at $3.50. They have also put out a very comprehensive line of men's union suits, among which are ecru cotton line at $6.87 1/2, lisle in ecru and white at $10.00 and a line of mercerized garments in wide range of colors and designs at $15.00. These goods are all made with yoke on the shoulder.

The carded yarn balbriggans made by the Capron Knitting Co., Gardiner & Waring and J. K. Stewart are all reported to be in a sold up condition. In fact, it is said that business on these lines came so easy that one manufacturer who made up samples with rib tails on the shirts took orders on the hem

tailed goods at the price that he started in to sell the ribbed tails.

Buyers have demanded double seated drawers on all lines of balbriggans, but do not seem to be so particular about rib tail shirts.

Most manufacturers have pursued the policy of selling their goods F. O. B. mill, and those who did not, are now regretting it, as a better opportunity to enforce all such conditions could not exist.

Desirable lines of ladies' straight ribbed vests at from 60 cents to 75 cents are also getting well conditioned and while no advances are reported, buyers find that extra values are getting out of the market and that they must take what is left.

Ladies' shaped goods show an advance of about 10 cents per dozen over last season's prices and so far as we can learn are not in as active demand as some other lines. However, there are only a limited number of manufacturers making this class of goods and they will have all the business that they need in a very short time.

HOSIERY.

Hosiery manufacturers have no complaint to make, regarding spring business for 1907. Plenty of orders are coming forward and apparently satisfactory prices are being obtained with the possible exception of 84-needle half hose; even in this line, there is a glimmer of hope ahead for those that survive. It is reported that two or three of these manufacturers have placed orders for fine gauge machinery and will stop making 84-needle goods; this will help matters somewhat.

An effort was made to form some sort of a combination of manufacturers of 84-needle goods in order to improve the situation. This effort was the result of a meeting held in Atlanta on May 25th, at which a number of manufacturers expressed themselves as being sick of the business and predicting that unless some improvement was made some of them wouuld go to the wall. Of course, there is a difference of opinion as to the cause of the condition, but it was made apparent that the production had increased about forty cases a day in two years. So far the movement has not met with success and indications are that it will not.

Only a few manufacturers are in a position to accept any more business on fashioned goods and all fine gauge seamless lines are being rapidly sold up. Those manufacturers who are still open for business on these lines have recently been asking advances of about 5 per cent. over the opening prices.

Embroidered styles of laces printed on extracted goods are the principal sellers at 50 cents and over. Gauze goods are in good demand in white, black and in a wide range of colors. They are more stylish than laces and cannot be made successfully in 25 cent grades and lower, so for that reason will continue to be desirable, but laces will claim the popular trade at 25 cents and under.

In half hose the demand has not centred on any one particular thing and some fancy lines are large and comprise about everything imaginable, although the two tone goods in dark shades are the most stylish.

Jacquard goods have had a large sale and the two domestic manufacturers of these goods are reported sold up.

Indications are that tans for both men and women will be more popular in 1907 than for the past two years. The two reasons given for this are the return of the popular tan shoe and the fact that brown will be good in men's clothing. Blue serge suits will be worn considerably another summer and as a consequence, navy blue hosiery promises to be good. Greys will be slower and it is predicted that they will be taken only in a staple way.

CHEMNITZ REPORT.

The hosiery market is still in a state that it has never been in before. The prices are very high, but nevertheless, all manufacturers have a great many orders on their books and in nearly all classes of goods, nothing can be had for immediate delivery, as no stocks are in the market and the production has been sold far ahead.

While up to a short time ago, buyers were holding back their orders for staple numbers on account of high prices they have to pay

for the old qualities, or the inferior grades that they can procure at the popular prices, they have now placed very liberal orders for such. In many instances they have allowed the extra cost, which will often compel them to ask a higher price for them, as they cost now as much to land, as they brought last year. On many articles in staple number the advances are 20 per cent. and more, and even at those prices, manufacturers do not care to take long contracts, as the cotton spinning mills will not sell yarns on long time, but are making their prices from case to case, so that the makers cannot tell what the material may cost them in two or three months.

Especially in lisles, the market is way up and material not only high, but also scarce and the mills have often to wait for weeks before they get in the necessary yarn.

In lace hose the market is just as high as ever and no prospects that any reduction will take place this season. The goods that used to cost $1.50 limit, quality to job at $3.00 to $3.25 are not in the market at all and cost a great deal more, so that they can only be retailed for fifty cents a pair. Before long there will be no lace hose for sale for delivery before the end of 1906.

While ladies' embroidered hose will be the principal sellers in the fancy line, the trade in men's half hose in striped and plaited styles has been very good during the last few weeks and large orders have been placed for such numbers. The embroidered hose will be a good deal higher in price than last year; in 25 cent numbers for ladies' wear there will hardly be anything in the market that approaches former standards and leaves a margin of profit. In the better styles the quality of the stocking has been changed and the embroidery has less stitches, so that these can again be sold at the popular prices, but to get the old styles at old quotations is entirely out of the question.

During the last two weeks a large demand for pearl greys has sprung up in the market and many very inferior numbers have been dyed in these shades, owing to the fact that the goods had to be shipped at once and nothing else was to be had in the market. Outside of these shades, nearly all other colors have been bought, but only in very limited quantities; the large demand is keeping up and for next season white is supposed to be very good. Tans are neglected, but some new greenish shades find ready sale for the better grade.

In gloves the rush is still as great as it has been all season, and makers could have plenty of orders, if they could only turn them out in the necessary time. Long gloves are still the craze and will remain so for next season also, as very large houses have placed their orders on these styles for delivery as late as February and March of next year. Any price is paid for small lots that can be shipped right away. As much as 25 per cent. more has been offered to makers if only they will make up the goods within four to five weeks; this, however, they cannot possibly do, unless they neglect the orders they have in their books which are long overdue.

A DEVICE FOR OPERATING NEEDLES

An improvement in knitting machines with vertically operated needles, has recently been patented by Bernard T. Steber, Utica, New York, who states that the object is to do the knitting, while alternate needles are held temporarily stationary, after which the situation is reversed, the stationary needles being brought into action and the active ones thrown out. Fig. 1 is a perspective view of a machine embodying the new device. Fig. 2 is a side elevation of a part of the needle spread out flat, showing the hooks arranged between temporarily stationary needles, this being the preferable arrangement of the parts when a sufficiently large needle-cylinder is used to admit of a dial and plate large enough to accommodate two cam-paths for operating the hooks alternately. Fig. 3 shows the arrangement adopted when the needle cylinder is small. Fig. 4 is a view of the cam section.

It is stated that an important feature of the present invention is the manner of securing and operating the horizontally-moving hooks with respect to the vertically-moving needles. The mechanism is so constructed that the horizontally-moving hooks are sus-

pended by a fixed member within the upper ends of the vertical needles and are so held as not to interfere with the operation of

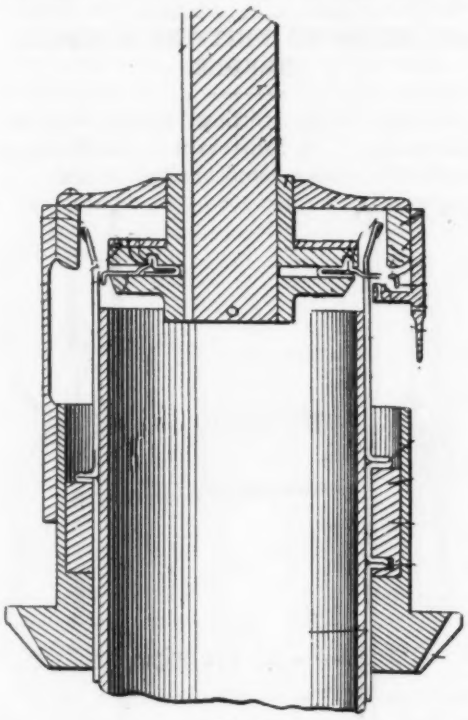


FIG. 1.

any of the parts of the mechanism. A standard is secured to the framing of the machine and carried a sufficient distance above the bed plate to permit of the use of a horizontally or laterally extending supporting arm. The inner end of the arm is carried to a point above the center of the knitting cylinder, and a depending rod or supporting bar is secured to this arm and extends to a point adjacent to the upper end of the needle cylinder. The arm is rigidly secured to the support, so as not to swing, and the depending shaft or rod is also secured to the arm.

The lower end of the shaft extends downward within the upper ends of the vertically moving needles a suitable distance to support the horizontal hook or needle dial properly, and it will be observed that the downward movement of the fabric is not obstructed by any lug inside the needle cylinder, as is usually the case with other machines. A supplementary thread can be laid without the use of hooks; but when a fabric is to be knit with a piled inner surface, hooks mounted in a dial to pull in the supplementary yarn in piles beyond the inner face of the cloth are used.

The supporting of the auxiliary device within the needle cylinder does not interfere in any way with the operation of the usual knitting needles. The auxiliary device may or may not be used, as desired, the hooks being kept out of operation by moving the hook engaging cams into their recesses on the inner sides of the cam grooves. The machine may thus be used for knitting circular fabrics of several kinds. When it is desired to provide a nap of any kind upon the inner surface of the fabric knit, the hook cams are thrown outwardly into their operative positions by a rotation of the annular

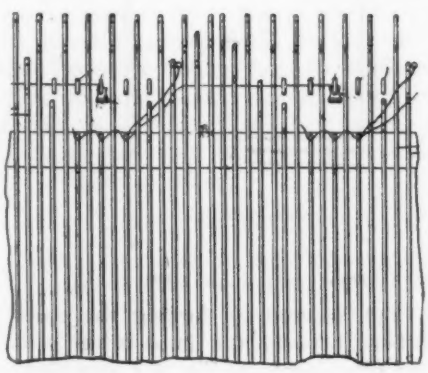


FIG. 2.

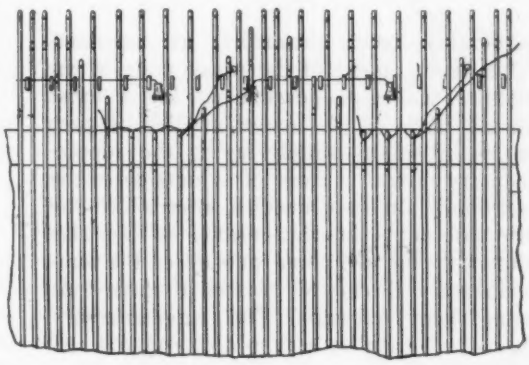


FIG 3.

slide, when the auxiliary yarn fed by means of the brackets will be engaged by the hooks and drawn inside the range of the stitches knitted by the vertically operating needles. In this way a succession of loops will be caused to project upon the inner surface of the fabric, and these loops may be cut or sheared, if desired, or left in the loop form, as preferred. If the auxiliary yarn be formed of material softly spun, the loops upon being napped will produce a fleece lining to the fabric.

The number of hooks employed in connection with the needles may be varied, and yet draw a loop back of every knitting-needle without departing in the least from the spirit of the invention.

The upper ends of the knitting-needles are

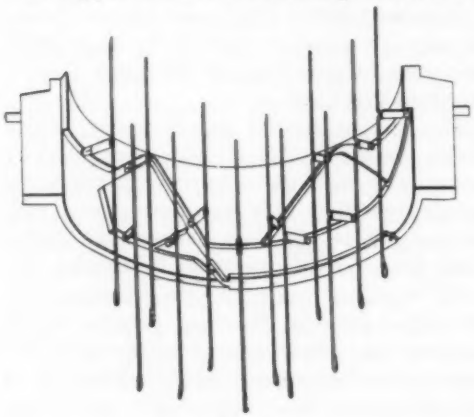


FIG. 4.

preferably bent outwardly, as indicated. This arrangement of the upper ends of the needles makes it possible to lay a loose thread back of the active needles of each series or set by simply laying the supplementary thread in front of or outside of the stationary alternate needles, after which the alternate active knitting-needles as they rise after knitting will come outside of the supplementary thread by reason of their tops being bent outward. The supplementary thread will then be held in a corrugated circular line in front of or outside of one set of needles and back of or inside of the other set of needles, and as the needles knit in the regular manner, this supplementary thread will be incorporated within the cloth about midway between its faces. This is especially useful in laying in elastic threads which it is not desired to knit with the needles.

AN IMPROVED KNITTING MACHINE NEEDLE.

A new latch knitting needle recently patented by E. H. Sturtevant of the Franklin Needle Co., has a band applied to the butt

FIG. 1.

FIG. 2.

or heel and secured by forcing the stock into the bend between the limbs of the heel. Fig. 1 is a side elevation; Fig. 2, a rear view; Fig. 3, an enlarged side view of the heel; Fig. 4, an enlarged rear view.

The needle has its butt or heel formed in the usual manner. The wire from which the

needle is made is doubled or folded or bent to form the butt or heel, and there is more or less space between the limbs of this fold or bend, as indicated. The band is of the usual form and applied to the butt or heel in the usual way, excepting that its stock is forced down into the space, and it is securely locked in place, so as to resist the loosening effect of usage.

As indicated, the depression of the stock of the band into the space may be effected by

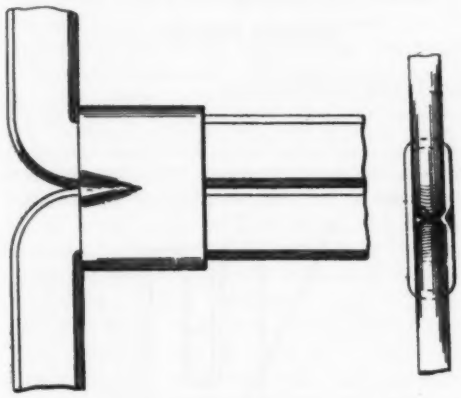


FIG. 3.

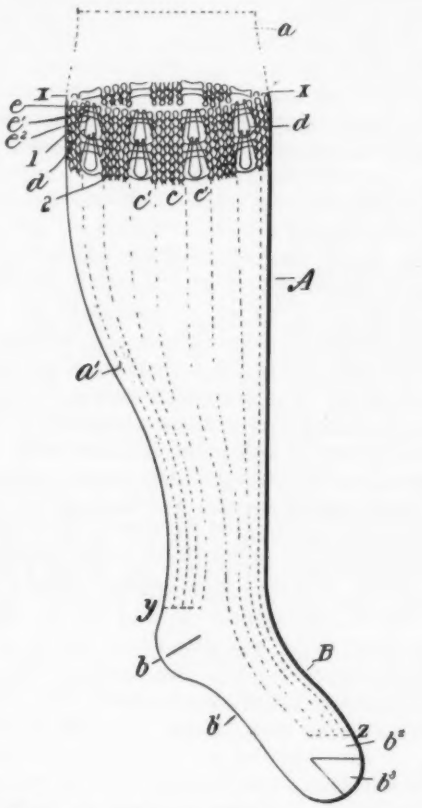
FIG. 4

a V-shaped punch, the apex pointing rearward; but other forms of punches may be used. The stock may be punched down from one side only; but it may also be punched down from opposite sides. Furthermore, this punching down of the stock of the band may be done at other points, the principle of the invention consisting in the locking of the band upon the butt or heel by displacing its stock externally into some cavity in the needle as distinguished from passing the stock of the band through the needle from one side to the other.

Many Englishmen formerly engaged in the hosiery trade have gone to the United States, and one British concern now established in the United States has several factories there exporting goods to Great Britain, and is said to have been instrumental in getting the United States' tariff raised against British hosiery and underwear.—British Tariff Commission.

NEW CONSTRUCTION FOR SEAMLESS HOSIERY.

A method of producing ornamented effects in seamless hosiery has recently been patented in this country and is shown in the accompanying illustration. It is described by the inventor as follows:



With the new construction a portion of plain knitting can be inserted at the top of the leg and the remainder consist of alternate sections of open work and plain knitting as desired.

The heel and bottom of the foot and toe are made of plain knitting, while the openwork sections are continued over the ankle and foot with a portion of plain-knitted fabric interposed between the lower end of such open or lace work sections and the toe.

A is the leg portion of the stocking, and B the foot portion. At the top of the leg portion is a plain-knitted portion, a. Com-

mencing at the point, x x, the leg of the stocking is formed of plain-knitted portions, c, united by open-work or lace sections, c', the one alternating with the other entirely around the leg. The loops of the several courses forming one figure of the lace or open work are made as follows:

Starting at the plain section, l, the thread forms a straight cross-thread, e, to the next plain section, crossing the space of one or more plain loops. A given number of plain loops is then made. The thread then makes a further cross-thread to the next section of plain knitting, and so on entirely around the leg of the stocking. On the next round the cross-threads, e', is made in like manner. On the third round the cross-thread, e^2, is made in the same manner. On the fourth round three cross-threads, e e' e^2, forming the elongated loop, d. This is continued to the point marked, y, where the heel is knitted of plain loops. After the formation of the heel the knitting is continued, forming the bottom of plain loops and the top of the ornamental courses and plain sections until the point, x, is reached, at which point a number of plain-knitted courses are formed entirely around the stocking. The toe is then completed with plain loops, thus forming a stocking which has the plain-knitted portion, a, the leg of ornamental sections, a', the heel b of plain loops, the bottom of the foot of plain knitting, b', and the sections, b^2, of plain knitting interposed between the ornamental courses and the toe, b^3, of the stocking.

This stocking may be made of one continuous thread, or it may be made by knitting the heel and toe of one thread and the remaining portions of the stocking from another thread, or it may be made by forming the heel and toe of one thread and the other portions of the stocking knitted from two, three, or four other threads, as the manufacturer may prefer. The stocking may be knitted upon a machine constructed in the well-known manner to produce tuck-knitting, provision being made for causing the needles of the front and back portions of the stocking to be thrown separately into operation to knit tuck or plain knitting as desired.

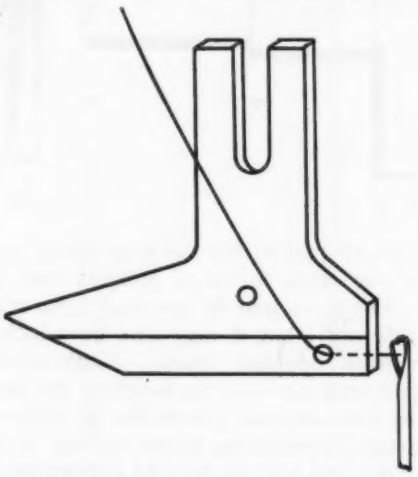
The proportion stated is not necessary or essential, as but one, two, or more of the cross-threads to every elongated loop may be employed to suit the taste or fancy of the manufacturer.

The arrangement of open-work spaces in respect to the plain-knitted portions may also be varied, and a single plain loop may be made between the lace sections, giving the stocking the appearance of being formed entirely of lacework, or this effect may be employed solely on the front of the stocking.

Dropped Stitches.

Editor Textile World Record:

I am having trouble with dropped stitches on our 36 gauge circular rib latch needle machine. The cylinder needles seem to drop or cut the stitch and close the latch. All the imperfections seem to be in the tuck stitch; the plain part is all right.



We are feeding in the upper holes of the yarn guides, using 30s worsted and 21s combed peeler, four of each. What is the matter?

Yuma (663).

In running worsted yarn on latch needle machines as fine as 36 gauge, it needs but a slight adjustment to drop stitches or stop dropping them. The cylinder should run exactly true. I have found that a little dirt on the bottom of the cylinder will sometimes cause dropped stitches. Again great care should be taken to tighten the screws that hold the cylinder fast. Do not tighten one screw on one side as tight as it will go, and then do the same to the next one, but tighten each of them a little at a time so as to tighten all of them as nearly together as possible. After having ascertained that there is no dirt or other obstruc-

tion under the cylinder, see how the cylinder needles close their latches. The latch should close just as it clears the end of the yarn carrier or feed. The latch must not touch the yarn carrier. The adjustment must be the same on all the feeds.

If the stitches are dropping from all the feeds it would be better to move the dial head forward or back a trifle so as to have the adjustment come as stated above. If the dropped stitches are not on all the carriers, but on only one or two, do not move the dial head, but adjust those yarn carriers in the position stated. The dial should be set so that when the yarn passes over the needles it will fall just back of the rivet, or the other side of the rivet farthest from the hook of the dial needle.

Another suggestion. Try a little vaseline on the cylinder. Take off a section and put the vaseline all around by turning the cylinder.

Another cause for the cylinder needles dropping stitches and cutting holes is the adjustment of the yarn carrier to the needles. If it is too far away or too close it will be liable to cause both imperfections, but it will not do to have the carrier touch the needles; set them as close to the needles as possible without touching. Also be sure that the holes of the yarn guides are perfectly smooth. If the porcelain eye is not used I would suggest smoothing the holes with a little emery paper and also smoothing up the sides of the yarn carriers next the needles. The worsted yarn should run over a tension. All worsted yarns knit better with a little tension and a small quantity of oil, but not enough oil to show on the fabric or leave an oil spot or stain. Yuma should use the lower hole of the yarn guide to feed the yarn through after he has adjusted the dial head or guides, so that the cylinder needles in drawing down will close their latches. If the cylinder needles still bend their latches it will be because the end of the latch catches in the upper hole of the yarn guide, and in that case it would be better to plug up the upper hole. Noel Howe.

It is evident from an examination of the sample showing the dropped stitches that the fault is with the needle. A perfect needle would not run as this one has done with the latch closed six revolutions without opening and taking a stitch. Upon examination under a glass I find that the worsted yarn has been cut, the yarn not being strong enough to open the defective latch when the needle rises to take the next stitch. Either the needle has been hit with the guide or the needle might have been an imperfect one when new. Not many years ago I found after considerable hard work trying to adjust guides (and several quiet talks with the superintendent) that the needles were imperfect. On making complaint to the manufacturer of the needles we were informed that by mistake they had used a thinner piece of paper between the latch and the side walls of the needle in the riveting process, with the result that the latch was not loose enough to work as free as it should. After getting other needles the trouble ceased.

The needle may have been hit with the guide, the guide being too close to the needle. The knitter should see that the latches are not in such a position as will allow them to fly out into the lower hole in the guide, thereby bending them so they will not work freely. It is absolutely necessary to keep the back and bottom of the yarn guides perfectly smooth, especially when on fine numbers. After passing up through the loop the latch is free when behind the guide to fly out. Any rough place on the guide will have a tendency to bend the latch, with the result that it will cut a hole or drop a stitch and stay closed.

It may be asked why, if this is true, that it drops on the tuck stitch and not on the plain. When on the tuck stitch the tension from the take up is carried more on the dial stitches than on the cylinder, as one-half of the dial needles have two stitches on them and are holding the preceding course from going down, thereby allowing the loop on the cylinder needles to be loose. When the needle rises to receive the next loop, the yarn not being taut on the cylinder needle and the latch being stiff, the yarn is carried on the needle and cuts off. When on the plain stitch the tension is distributed to both dial and cylinder needles; instead of a drop stitch the defective latch will cut a hole.

Another condition will cause this trouble. If the cylinder needles are not drawing quick enough and low enough below the edge of the cylinder to form a loop large enough, the yarn will be cut when the needle is raised for the next loop.

Halifax.

I think the main cause for the dropped stitches in the sample of knit goods sent is not getting out all the bad needles from the cylinder. The sample shows that there is a bent latch in the needle, caused by a defective guide, which may not be set just right or which may be scarred so that the latch when open does not always strike the same place on the guide; and when it takes a different angle it has a tendency to bend the latch. This will often produce the effect of a dropped or cut stitch. Without seeing the machine I cannot tell just how to set the guide, but if Yuma will see that the guides are free from scars and not set so close as to bend the latches, there will be no more trouble. Grant.

It seems to me there is an uneven stitch in the

sample. This should be remedied and if that does not stop the trouble swing the cap forward about one needle, set the guide back so that closing the latch on the cylinder needle will just miss it, and the heel of the guide as close as possible to the needle without rubbing. I think it would help matters also to put just a little more tension on the cloth and if these suggestions do not correct the trouble, draw back slightly more on the dial needles. Onota.

Yarn for Different Gauges.

Editor Textile World Record:

Kindly let me know the proper numbers of yarn, singles and lisles, that should be used with the different gauges of needles in circular machines to give the best results. Will a 240-needle 3 3/4-inch cylinder machine make as good ladies' hose as a 260-needle 4-inch machine? Morgan (700).

Following are the sizes of the yarns that will give the best results on 3 1/2-inch machines.

108 needles	5½s	or 2/10s.
120 needles	6s	or 2/11s.
136 needles	9s	or 2/20s.
142 needles	10s	or 2/22s.
160 needles	12s	or 2/24s.
180 needles	14s	or 2/26s.
200 needles	18s	or 2/40s.

A 240-needle 3 3/4-inch cylinder will make a better hose than a 260-needle 4-inch cylinder. The appearance will be about the same and there is a better result when fitting on the forms.

Merrill.

Stains on Knit Goods.

The stain in the sample submitted is what is called a kier stain and is caused by insufficient liquor in the kier during the boiling process. The alkaline liquor used for scouring having put in solution the natural oils in the goods that it has come in contact with, deposits them wherever the stains appear. If the kier is the old fashioned, low pressure center vomit type, the stains will be found mostly near the top of the lot, but if the liquor is very low they will be found all through the goods. To avoid this Redwood should make up the kier in the manner following:

Do not fill the kier too full of goods; let the cap of the vomit pipe be at least 12 or 14 inches above the top of the goods; let the liquor cover the goods to a depth of two or three inches all over the lot before turning on the steam; be sure the blow-off valve is closed tight; be sure the kier has no leaks. One and one-half pounds of caustic soda to 100 pounds of cloth is sufficient to give good results if these rules are observed. Old or wooden kiers are liable to spring a leak at any time, and in such case, if the stains repeat themselves, the goods should be soured and washed back into the kier and boiled again.

Old Practical bleacher.

The National Association of Hosiery Manufacturers.

The headquarters of the National Association of Hosiery Manufacturers has been transferred to Philadelphia where the secretary-treasurer, C. B. Carter, will reside. This removal has been brought to the attention of the trade by the following circular letter from Mr. Carter:

Philadelphia, Pa., June 19, 1906.

To the Members of the National Association of Hosiery Manufacturers.

Gentlemen: I am again in Philadelphia in the interest of our Association, soliciting new members and otherwise working for the welfare of the organization and particularly for the advancement and protection of the best interests of our individual members.

I am also pleased to advise that I am also here for the purpose of making arrangements to move to Philadelphia, where I shall permanently reside, as I feel that I can serve the Association to much better advantage by having my headquarters here. I am also arranging to devote my entire time to the National Association of Hosiery Manufacturers for the reason there are so many avenues of usefulness open before our Association which can be successfully utilized through thorough and vigorous efforts. And then again Philadelphia is the recognized centre of the hosiery industry and for this reason it is very essential that the secretary-treasurer should be located here.

I wish to take this opportunity to call your attention to our Information Bureau, which you will remember is our credit department, embracing the names of the undesirable customers of our members. If the last bulletin sent you, viz: No. 2, does not embrace the names of all of your undesirable customers, please send me to Knoxville at once such names in order that I can include the same in the next Bulletin.

Yours very truly,

C. B. Carter,
Secretary-Treasurer.

Recent Knitting Patents.

HOSIERY, Manufacture of Seamless. 821,944. Edward E. Kilbourn, New Brunswick, N. J., assignor to the Kilbourn Knitting Machine Co.

HOSIERY. SEAMLESS. 822,044. George H. Gilbert, Germantown, Pa., assignor to the Kilbourn Knitting Machine Co.

HOSIERY, SEAMLESS. 822,663. George H. Gilbert, Germantown, Pa., assignor to the Kilbourn Knitting Machine Co., New Brunswick, N. J.

HOSIERY, SEAMLESS. 822,890. George H. Gilbert, Germantown, Pa.

KNITTING MACHINE. 824,043. John P. Sheppard, George B. Sheppard, and Arthur J. Mankin.

KNITTING MACHINE, Rack Stitch Rib. 823,818. Walter Stafford and Robert C. Holt, Little Falls, N. Y.

KNITTING MACHINE, Circular Independent Needle. 822,564. Joseph Wheeler, Philadelphia, Pa., assignor of one-half to Henry Brown, Philadelphia.

KNITTING MACHINE NEEDLE. 822,401. Edward H. Sturtevant, Franklin, N. H.

KNITTING MACHINE, Stop Motion Device. 821,969. Louis N. D. Williams, Ashbourne, Pa., assignor of one-half to Robert W. Scott, Philadelphia, Pa.

KNITTING MILL NEWS.

New Mills.

Indiana, Indianapolis. The Logansport Underwear Company has been incorporated with capital stock of $15,000 and will start a plant for making knit goods. Among those mentioned as interested are Dennis Uhl, William Uhl and James M. Potter.

New Jersey, New Brunswick. The Interwoven Stocking Company has been incorporated with capital stock of $500,000. Ernest Blood, Philadelphia; Frederick S. Jackson, New York, and Willard P. Voorhees, of this place, are interested.

New Jersey, Paterson. The Paterson Knitting Mills is a new concern just starting operations in the Hamilton Mill on Mill St. A. Kubrinets and S. Solte are the proprietors. They manufacture fleece lined underwear, operating two knitting machines. Wm. A. Herington is general superintendent of the plant.

New York, Amsterdam. Work has been practically completed on the new building for Fownes Bros. & Co., and it is expected that operations will start early in July.

*North Carolina, Haw River. The Regina Hosiery Company is now operating their new mill with full equipment. This company is capitalized at $25,000, with J. A. Long, president; W. H. Childrey, secretary, treasurer and general manager. Women's seamless hosiery is made. Plant is now equipped with 10 latch needle knitting machines and one sewing machine, using gasoline at present

*Pennsylvania, Mohn's Store. Work is under way on erection of the new buildings for A. S. Hornberger & Co., to manufacture ladies' Swiss ribbed vests. It is expected to begin operations about August 1st, with 5 body frames and 3 sewing machines. A. S. Hornberger is agent and buyer for the concern.

*Pennsylvania, Reading. The Berkshire Knitting Mills have been incorporated with capital stock of $60,000, to succeed to the hosiery department of the Textile Machine Works. Gustav Oberlaender is treasurer of the new company. Plant is equipped with 20 full fashioned knitting machines, 12 sewing machines and 9 loopers, making cotton and lisle hosiery. E. O. Spindler is selling agent for the goods.

*Tennessee, London. Bids are now being received by the London Hosiery Mills on construction of their new buildings.

*Wisconsin, Kenosha. Beachel & Johnson are now operating a knitting plant at this place, making men's high grade ribbed underwear. Plant is equipped with 4 knitting and 12 sewing machines. Product is sold direct.

*Wisconsin, Milwaukee. Operations have begun in the new plant recently started at this place by the Everwear Hosiery Company, incorporated with capital stock of $15,000. Fred M. Hanson is president of the company; Fred Braun, treasurer and Jos. H. Zens, superintendent. The plant is equipped with dye house and operated by steam power. Product is sold direct.

Enlargements and Improvements.

California, San Francisco. The Pfister Knitting Co., whose plant at 60 Geary St. was destroyed at time of earthquake, will start at once to rebuild same, with increased facilities.

Georgia, Athens. The Climax Hosiery Mills are reported to increase the capacity of their plant to 750 dozen hose daily.

Georgia, Grantville. The Grantville Hosiery Mills have recently placed an order for 2,000 additional spindles.

Maryland, Hagerstown. At a recent meeting of the directors of the Blue Ridge Knitting Co., it was voted to issue additional stock of $125,000 for purpose of building a new addition and installing additional knitting machinery.

Massachusetts, Lowell. The Lowell Hosiery Co. is reported as contemplating installation of 75 machines for making lace hosiery.

*Michigan, Bay City. Work is nearing completion on the World's Star Knitting Company's new mill.

New Hampshire, Nashua. The Granite State Knitting Company will start operations shortly, making overalls, jumpers, etc., in addition to the knitting plant, under the name of the Granite Overall Co.

New York, Hoosick Falls. The Superior Mfg. Co., operating 95 knitters on ladies' and children's cotton and worsted ribbed underwear, whose plant has been shut down for the purpose of making repairs to its machinery, etc., will start up again on Monday, the 11th of June.

North Carolina, Albemarle. The Wiscassett Mills Company is making arrangements to install a number of new hosiery machines in the plant.

North Carolina, Albemarle. The Lillian Knitting Mills are reported as contemplating doubling the present capacity of the plant.

North Carolina, Chapel Hill. The Blanche Knitting Mills contemplate installing a dye plant in the mill.

North Carolina, Kernersville. The Victor Hosiery Mills, of which W. H. Leak & Co. are the proprietors, manufacturers of men's heavy half hose on 42 knitters, selling the product direct, have met with so much success on this line of goods that they are contemplating putting in machines for the manufacture of a line of misses' hose and are looking up machinery with that end in view.

North Carolina, Lexington. The Yadkin Knitting Mills Co. is to install additional machinery.

North Carolina, Newton. The Newton Hosiery Mills have recently been equipped with additional machinery, including an electric plant with 175-h. p. engine.

*North Carolina, Valdese. The Waldensian Hosiery Mills, manufacturing men's, misses' and ladies' hosiery, are installing 20 new knitting machines in the plant. They are not making any addition to building or power. The product of this plant is sold by J. D. Bloomer, 43 Leonard St., New York.

Ohio, Cleveland. Bamberger & Neuman, manufacturers of knit goods, fascinators, shawls, toques, are increasing their business 50 per cent. and are erecting a new building, 110 by 150 feet, four stories.

Pennsylvania, Annville. A. R. Kreider & Bro. have equipped several of their machines with attachments for making lace striped half hose.

*Pennsylvania, Mechanicsburg. The Blue Ridge Knitting Co., recently reported having purchased the Black Rock Knitting Co.'s plant at this place, will operate the plant here as a branch mill.

Pennsylvania, Philadelphia. The Stratford Knitting Mills are reported as contemplating erection of another new mill, about 210 by 65 feet, one story, for purpose of doubling capacity of the present plant. In addition to manufacturing ladies' union suits, they will also make men's.

Pennsylvania, Philadelphia. Several textile publications have made the announcement that Barger, Bains & Munn, manufacturers of seamless hosiery at Mascher and Turner Sts., have been seeking a suitable location outside of this city for the purpose of removing their plant. The members of the firm state that this is not true, but they have made arrangements to start up a branch mill at Bloomsburg, Pa., which will be equipped at the start with 15 machines, which will be increased as the necessity demands. The new plant will be put in operation July 1st.

Pennsylvania, Philadelphia. Joseph Fussner, proprietor of the Fussner Hosiery Mills, operating 65 knitters on infants' fine cotton and woolen hosiery, has removed his establishment from 4155 Frankford Ave., to 2411 N. Howard St., where he is now in full operation.

Pennsylvania, Scranton. The Lackawanna Knitting Mills Company proposes building a large addition to the plant. They will also enlarge the warehouse.

*Tennessee, Niota. Work is under way on the addition, 60 by 65 feet, two stories, to the Crescent Hosiery Mill.

Tennessee, Knoxville. An addition is to be built for a woolen mill by the Standard Knitting Mills.

*Virginia, Portsmouth. The Parker Hosiery Mill & Dye Works, reported to build an addition, will operate same as a branch mill, to be known as the Bethel Hosiery Mill. This building will be 75 by 32 feet, one story, brick, and will be equipped with 25 knitting machines, 25 ribbers and 10 loopers, with capacity of 250 dozen per day. Electricity will be the motive power.

*Wisconsin, Menasha. The Fox River Valley Knitting Co. has not yet completed arrangements for purchase of the Germania Opera House and unless they are able to negotiate for same, will be obliged to build an addition to plant here, or build an entirely new plant at another location.

Mills Shutting Down.

New York, Cohoes. The Himes Underwear Mill has been closed for the summer. This is the outcome of some difficulty with operators in the card room.

Facts and Gossip.

California, San Francisco. The Gantner & Mattern Co. advises us that their plant escaped destruction by the recent fire and earthquake. Their plant has been running to its full capacity since May 7th. The retail store and wholesale departments were consumed by the fire. Numerous one-story buildings are being erected for salesrooms for the wholesalers and warehouses are being erected on the outskirts of the city for stock.

New York, Port Henry. Geo. B. Strauss is looking up the subject of knitting machinery for hosiery, and may engage in the business.

New York, Rome. The Fort Stanwix Knitting Company has been reorganized, W. J. Carroll controlling most of the stock. Mrs. Teresa M. Carroll is the new treasurer, succeeding W. J. Doyle, who retires.

Pennsylvania, Philadelphia. The Boardman Knitting Mills, 10th and Diamond Sts., which succeeded the Standard Knitting Mills, has now been succeeded by the Defiance Knitting Mills, which took over the business about three weeks ago. The new company has a capital of $15,000 and the following officers: Jacob Rositzky, president and D. Joffe, secretary and treasurer, and Edwin Boardman, superintendent. Ladies' and children's ribbed underwear of silk, cotton, lisle and worsted are still being manufactured by the company, who are operating 30 knitters and 30 sewing machines, reporting that their books are filled with orders. The production is sold direct. D. Joffe does the buying.

Pennsylvania, Philadelphia. The Vesper Knitting Mills, owned and operated by Messrs. Hoffman Bros. & Creshkoff at 1220 Crease St., with 45 knitters on men's and women's hosiery, and which recently went into the hands of a receiver, has been sold out at public auction. The fourth floor of the Thornton Mill, which they occupied, has been leased by another manufacturer of knit goods in this city, who will equip it with machinery and run it as a branch plant, commencing July 1st.

Virginia, Lynchburg. It is reported that the Lynchburg Hosiery Mills, now operated under a copartnership, are to be incorporated with capital stock of $25,000. Jos. G. Burton is manager of the plant.

Personals.

J. A. Pooler, for some years overseer of carding for the Haile & Frost Mfg. Co. of Hinsdale, N. H., has resigned his position to take one as superintendent of carding, spinning and knitting for the Lackawanna Mills of Scranton, Pa. He is succeeded by Wylie Wright of Spencer, Mass.

Richard Reilly, for a number of years overseer of the knitting department of the Glenark Mills of Woonsocket, R. I., has resigned his position to take a similar position with the Fitch Mfg. Co. of Thornton, R. I.

Mr. J. A. Routh, who has been superintendent of the finishing room of the Crescent Manufacturing Company of Spartanburg, S. C., has resigned and returned to his home in Kernersville, N. C.

Mr. Otto Oppelt, head of the dyeing department of Crescent Manufacturing Company of Spartanburg, S. C., has resigned and it is understood that he will go to the Blue Ridge Hosiery Mills, Landrun, S. C.

M. D. Hall, overseer of knitting for the Fort Plain Knitting Co. of Fort Plain, N. Y., has resigned his position and has been succeeded by John Mooney of Utica.

Mr. J. A. Gault of Union, S. C., has accepted the superintendency of Crescent Manufacturing Company of Spartanburg, S. C.

General Mill News.

Pennsylvania, Philadelphia. The Lowd Manufacturing Co., operators of a plant for the manufacture of misses', children's and infants' underwear and ladies' skirts, cotton and worsted ribbed, on 20 rib frames and 20 sewing machines, has passed into the hands of the Mayo and Avalon Mills, manufacturers of cotton yarns in Mayodan, N. C., with offices in the Bourse Building, and H. M. Daniell as manager. Under the new management the plant will be run on misses' and children's underwear only, which will be sold through Lamson, King & Co., N. Y. The mill is located at 11th and Noble Sts., the main office in the future to be in the Bourse Building.

Pennsylvania, Philadelphia. Messrs. Edward Clegg's Sons announce that the partnership existing between Alfred Clegg, Thomas Clegg and Bella M. Clegg, trading as Edward Cleggs Sons, has been dissolved, Alfred Clegg retiring from the firm. The business in the future will be continued by Thomas Clegg, Edward Clegg and Bella M. Clegg, under the name of Edward Clegg & Sons. They are manufacturers of wool shoddies on 6 sets cards and 4 pickers, the plant being located at Howard and Berks Sts.

Pennsylvania, Philadelphia. The Davies Textile Company, Frankford, is to manufacture a finer line of goods than formerly. A new line of dress goods and fine curtains will be made.

*Pennsylvania, Philadelphia. The Germantown Braid Co., manufacturing braids for Swiss ribbed underwear, proposes manufacturing braids for men's underwear next year. They propose adding another story to the plant.

Pennsylvania, Philadelphia. The Receiver of the Bromley Bros. Carpet Co., York and Jasper Sts., has decided to sell the plant out at public sale and has appointed July the 9th for that purpose.

Pennsylvania, Philadelphia. The Brown-Aberle Co., Palethorp and Huntingdon streets, manufacturers of full fashioned hosiery on 900 knitters and 50 sewing machines, with dye house, incorporated under the laws of New Jersey, have applied for a charter under the laws of the State of Pennsylvania. The company has now a capital of $500,000 with Gustav Rumpf, president; Thos. E. Brown, treasurer, and Henry Brown, supt.

Pennsylvania, Philadelphia. An announcement has been made by the Valkone Dye & Finishing Works at Mascher and Turner streets, to the effect that the copartnership existing between Cornelius Sullivan and Henry L. Webster, proprietors of the plant, has been dissolved by mutual consent. All persons indebted to said partnership are requested to make payments to Cornelius Sullivan, who will continue the business under the same name and at the same address.

Quebec, Sherbrooke. The Crown Spinning Co. has been incorporated with capital stock of $100,000, for purpose of manufacturing woolens, cottons, etc. Among those interested are W. R. Webster, S. W. Jenckes and H. A. Moore.

Pennsylvania, Towanda. At the annual meeting of the directors of the Towanda Silk Mill, held recently, W. J. Hartman was elected president; Moses O'Malley, vice-president, and E. P. Fuller, secretary and treasurer.

Pennsylvania, York. It is reported that the York Silk Mfg. Co. is planning a large silk combine and they have under consideration the plant of the Paul Clemens Silk Co., at Scranton, Pa.

*Rhode Island, Pawtucket. The Providence Braid Co. has not yet made definite arrangements regarding their new plant to be built at Pawtucket.

Rhode Island, River Point. B. B. & R. Knight, who have the American Moistening Company's system very generally introduced, are now equipping their Valley Queen Mill.

Switzerland, Wohlen. Louis Knecht and other parties expect to incorporate a new company in the United States in the course of a few months, which will build and operate a textile factory, the character of which is not yet determined.

Texas, Dallas. The Dallas Woolen Company has been incorporated with capital stock of $25,000. W. W. Graham, J. O. Stanage and S. T. Gray are among those mentioned as interested.

Virginia, Danville. Part of the roofing on the dye house of the Riverside Cotton Mills was torn off during the recent rain storm.

Washington, Seattle. E. T. B. Mills of San Francisco is reported as contemplating establishment of a linen twine plant for netting.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Loose Reed Motion. The Crompton & Knowles Loom Works, Worcester, Mass., have recently adopted a loose reed motion for their looms.

Logwood Black. Lepetit, Dollfus & Gansser, Milan, Italy, have recently brought out a patented process to increase the depth of shade of logwood black. It is described in another part of this issue.

Sizing Apparatus. The Elsassischen Maschinenbau-Gesellchaft, Mulhause, Germany, recently placed on the market an improved sizing apparatus, which is described in another part of this issue.

Fulling Mill. Max Kemmerich Machine Works, Aachen, Germany, have recently brought out a fulling mill with two top rolls. The machine is described in another part of this issue.

Attachment for Card Feeds. Wilhelm Salberg, Gladbach, Germany. An attachment for second breakers and finishers intended to overcome the tendency of the card to make fine ends on the sides. A description appears in another part of this issue.

Lustre Process. Andre Samuel, Lyon, France, has recently brought out a process for lustring patterns on fabrics by printing with colorless and tinted solutions of nitro cellulose.

Picker Stick. Oberholzer & Busch, Zurich, Switzerland, have recently brought out an improved picker stick. A strap of raw hide is inserted and glued into the centre of the stick. It is said that many of the new sticks are in use and that the results so far are very satisfactory, the stick being very elastic and durable. The price is $3.00 per dozen.

New Noble Comb. White & Cooper, Bradford, England. have recently brought out a new form of the Noble worsted comb for which several important advantages are claimed. The ordinary dabbing brush is dispensed with; there are three small circles instead of two and the whole of the top gear used in the ordinary Noble comb is removed. It is said that the vibration of the machine is greatly reduced and that production is increased. A recent test showed the production of 50s to 54s cross bred wool with ten-ounce ends to be 1,000 pounds in ten hours.

Cork Inserts. The National Brake & Clutch Company, Boston, whose process of cork inserts for pulleys and friction clutches, brakes, etc., has long been in successful use in railway and machine work, has for some time past been experimenting with their "Compo" for loom clutches.

The Crompton & Knowles Loom Works and the Crompton-Thayer Loom Company are now using the "Compo" cork inserts for loom clutches to considerable extent. The new Wood Worsted Mill has ordered 600 looms fitted with these clutches, and expect to order more for the remainder of their equipment.

Some tests of loom clutches made at the Worcester Polytechnic Institute showed that at the same pressure of clutch, the "Compo" clutch (cork inserts) transmitted 96.48 pound feet of torque as against 47.56 pound feet for the standard leather-faced clutch, and this with smoothness of engagement and without gripping or seizing; and that at one-half the pressure the "Compo" clutch transmitted equal torque. The average results of over 100 pulley tests made at the same place showed for an 18-inch iron pulley with cork inserts an increase in power-transmitting capacity of 51 per cent. over plain iron pulleys of the same diameter.

A NEW SIZING MACHINE.

An improved machine for sizing warps has been brought out recently in Alsace and is shown in the accompanying illustrations. It enables the size to be boiled without the use of direct steam. Fig. 1 is a perspective view of the apparatus. It is claimed that very uniform results and an important economy in the use of the steam and the sizing material are effected. The size is heated under steam

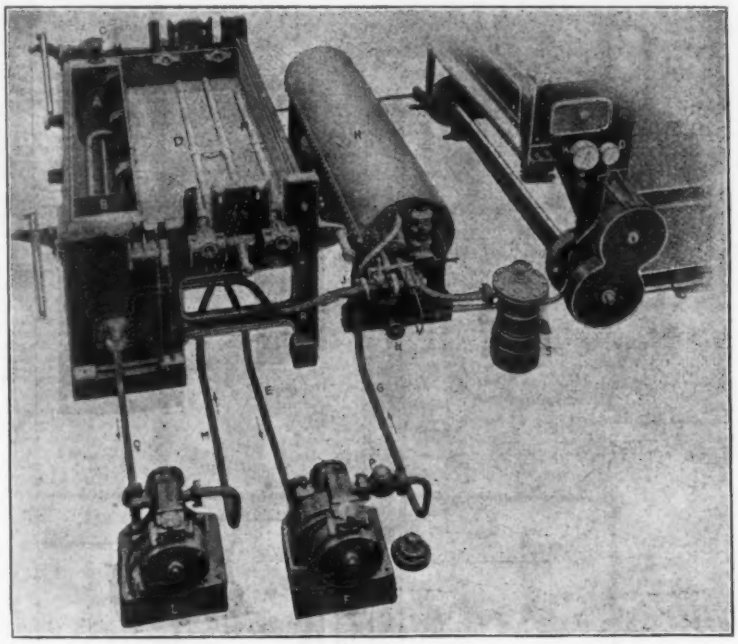


FIG. 1.

pressure from 240 to 248 degrees F. without bringing the steam in direct contact with the sizing material. As a consequence it is claimed the size is more uniform and homogeneous, possesses greater cohesive power and is distributed over the surface of the thread much better than when it is boiled with direct steam. The size trough is divided by an upright partition into two parts, the first tank and the size trough, D. The first of these divisions is also divided into two parts, A and B. The sizing mixture is introduced in the ordinary manner through the funnel, C, and mixed in the holder, A, which receives the overflow from the trough, D. A rotary pump, F, sucks the size through the pipe, E, and forces it through the pipe, G, and through a coil in the kettle, H. The size is held in this coil by a weighted valve, J, and the temperature is indicated by the thermometer, K. The outlet pipe, R, discharges into the holder, B, from which the pump, L, draws the thoroughly boiled size through the pipe, Q, and delivers it to the trough, D.

The valve, N, is to regulate the steam pressure in the drum, H. A self-regulating steam valve can be used here if desired. The steam pressure is indicated by a gauge, O. A check valve, P, prevents the size from running back into the pump, F. The condensed water in the tank, H, is carried into the condenser tank. The holders, A B, are provided with perforated steam pipes so that direct steam can be used if desired. This, however, is done only at the beginning of work after the size has cooled over night. Boiling for fifteen or twenty minutes in the morning prepares the size for use and after that the circulation system answers every purpose.

With this machine the boiling of the size can be regulated very closely and the size brought to the desired temperature so that the best results are obtained. It is well known that when size is boiled too much its qualities are impaired.

Fig. 2 shows a side view and a plan of the apparatus connected with the regular warp-

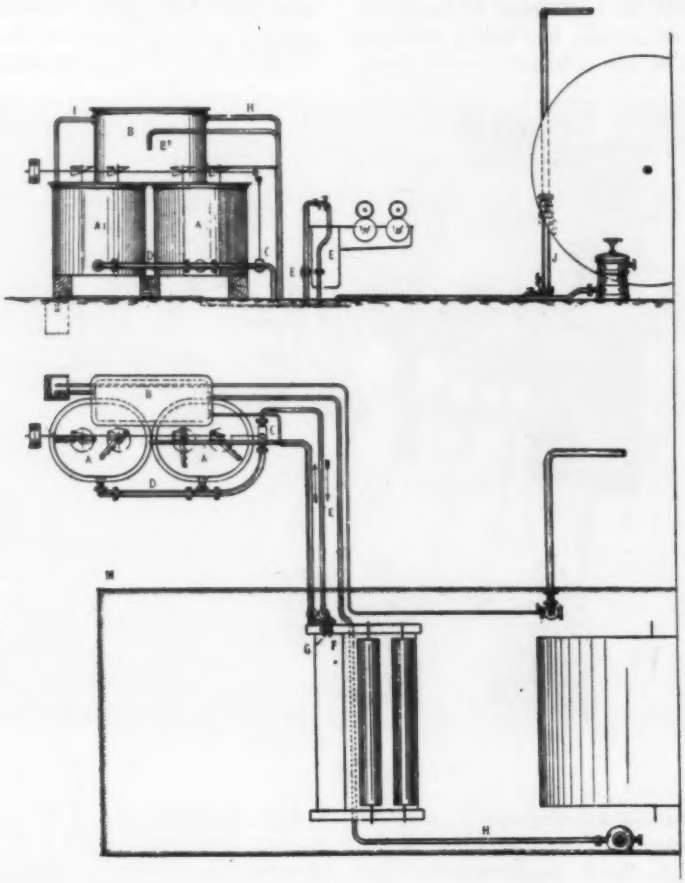


FIG. 2.

ing machine. It consists of two oval sheet iron tanks, a a', into which double rotary wings mix the size thoroughly. Above this is a holder for warm water which also receives the condensed water from the cylinder. The sizing mixture is prepared with warm water, care being taken not to allow the temperature to get above 140° to 150° F. Under the tanks is a bronze pump, C, which takes the size from the tanks through the suction pipe, D, and delivers it to a pipe, E. The same pipe serves to carry the overflow which passes through the pipe, e', to the size tanks, a a'. Over the size tank is a valve E, which delivers the size through the funnel. By this valve the quantity can be regulated as desired. To thin the mixture warm water may be delivered by the valve, G, If the size becomes too thin by reason of the addition of condensed water the desired consistency can be obtained by shutting the water valve. The condensed water from the drying cylinders is delivered by the pipe, H. Care must be taken not to have the endless pipe immersed in the receiving tank. J is the overflow pipe and the steam feed pipe of the sizing machine is shown at I.—Uhland's Technische Rundschau.

AN ATTACHMENT FOR CARD FEEDS.

A device to prevent fine ends on woolen cards has recently been invented in Germany and is described as follows: The high speed at which the fancy of a woolen card is run creates a strong draft of air from the sides to the center of the card, which has a tendency to carry the stock in the same direction. This causes the stock to pile up in

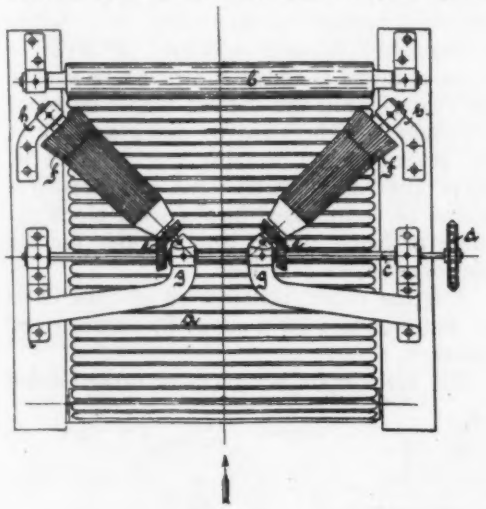


FIG. 1.

the center of the cards and gives a thinner layer on the sides making fine ends on the fancy card, or thin edges on the web. This irregularity is also increased by the fact that more or less of the stock flies from the

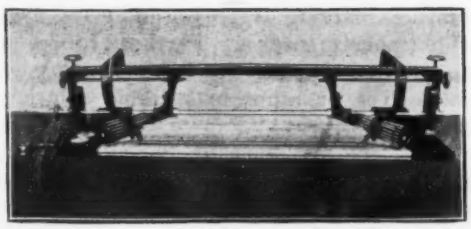


FIG. 2.

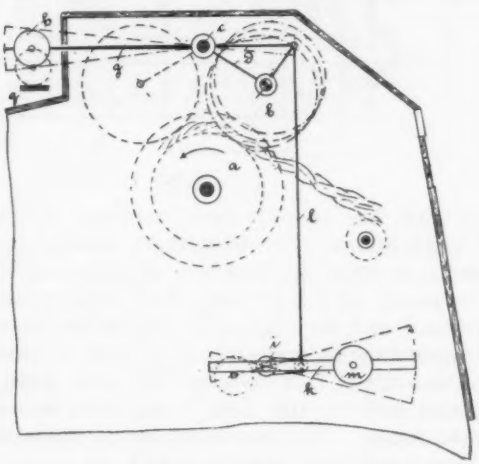
sides of the card. It is to overcome this difficulty that the device about to be described has been designed.

A plan of the new attachment is shown at Fig. 1 and consists of two fluted rollers, f, which are placed in a diagonal position above the feed table, one at each side. These rollers are cone shaped and revolve in the bearings, g, h. The method of driving will be readily understood from the drawing. The object of these rollers is to contract and thicken the edges of the lap so as to overcome the tendency of the fancy to make them thinner.

A slightly different form of the device is shown at Fig. 2. The roller shown just above the table is for the purpose of pressing the stock smoothly on the table, but it is not essential. The fluted rollers, f, can be changed to any form desired and adjusted either sideways, lengthways or vertically, to suit the different kinds of stock.

AN IMPROVED FULLING MILL.

The fulling mill shown in the accompanying illustration has recently been brought out in Germany. In the description given by the manufacturer it is stated that with fulling mills having two top rolls difficulty is often found in regulating the pressure of the front roll and it is often found necessary to bal-



ance the front roll with levers and weights. This is especially the case with delicate fabrics. In the new machine the front roll is hung on a lever swinging on an axis, c, at the other end of which are the balance weights, h. By sliding the weights on the arm the pressure of the front roll can be readily regulated or entirely removed if de-

sired. Above the main roller, a, the lever, d, swings on the shaft, c. At one end of this lever is the front roll. The lever, d, is connected at one end by the rod, l, with the lever and weights, k, m. The weight, m, can be moved along the lever to give the pressure desired. The front roll, b. is shown in working position, the pressure on it being reduced by moving the weight, m, toward the axis, i.

If it is desired to relieve the goods of all pressure from the front roll, b, the weight, m, is shoved to the other side of the axis, i, at the point indicated by the dotted circle. This permits the weight, h, to lift the front roll, b, from the goods. The upward movement of the roller, b, is limited by placing the buffer, g, in position to stop the weight, h. This machine is said to be giving very good results on light weight fabrics.

AN IMPROVED ROLLER FOR MANGLING MACHINES.

A cork roller for washing and mangling machines, invented in Portugal by a dealer in cork, has recently been patented in the United States. The advantages claimed for the cork roller are that it is not affected by moisture, or by friction, that it is easily cleaned and very durable. Fig. 1 shows a longitudinal section; Fig. 2, a cross section of the roller. It is made of cork slabs, granulated cork or cork dust, compressed into a solid mass. The process of manufacture is described by the inventor as follows:

In using slabs or disks two of them are placed within a suitably-shaped chamber and subjected to a pressure of two or three thousand pounds to the square inch as found suitable. The ram of the press is then raised and a third slab introduced, the pressure again applied, the ram again raised, a fourth slab introduced to the cylinder, pressure once more applied, and so on alternately adding a slab and applying the pressure until the block within the cylinder or chamber is of the desired length. Each pressure permanently fixes or attaches the last-added slab or disk to the rest of the block.

When employing granulated cork or cork-dust, a suitable quantity (preferably representing two subsequent layers) is placed within the pressure chamber or cylinder and pressure applied, as aforesaid, after which a regulated uniform quantity or layer of loose material is added and pressure applied alternately until the desired length of block is obtained. The slabs or disks, as well as the several layers of loose material, are by these alternate introductions and pressures bound or compressed into a solid block capable of being turned into a roller for the purposes before described.

A is the roller, constructed of cork disks a', and mounted on a shaft, B, between end plates, b.

The block upon being cut or turned down and made cylindrical presents a smooth and uniform surface unaffected by water, temperatures, varying degrees of moisture, dyes, or peripheral friction. Further, rollers of this construction are not liable to retain or exude dyes or other undesirable coloring-matter.

In rollers for domestic or laundry purposes, especially for mangling, the natural recesses or depressions which occur in the cork are filled by treating the surfaces with a solution or paste composed of materials or substances impervious to and unaffected by hot water, such as alcohol and shellac in equal parts, calcium phosphate, and boiled linseed-oil, the shellac to be dissolved in the alcohol and mixed with the calcium phosphate and linseed-oil until they form a paste.

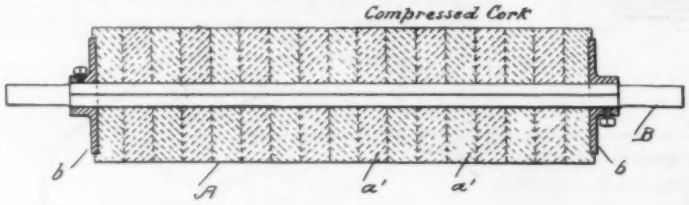


FIG. 1.

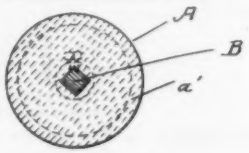


FIG. 2.

A solution of animal glue and two per cent. of potassium bichromate may be used instead. After exposing the roller so treated to bright sunlight for one to six months the filling becomes impervious to hot water.

A SADDLE FOR TOP ROLLS.

The advantages claimed for a saddle for the top rolls of spinning machines, recently patented in this country include simplicity of construction, low cost, durability and ease in adjusting the pressure.

Fig. 1 is a side elevation showing the new saddle in position to press on the middle roll. Fig. 2 is a similar view with the saddle reversed to remove pressure from the middle roll, and Fig. 3 is a front elevation with the saddle arranged in the same manner as in Fig. 1.

E is the spring of the saddle, and F is the rod for connecting the saddle-body with the ordinary weighted lever.

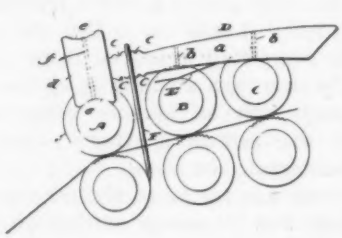


FIG. 1.

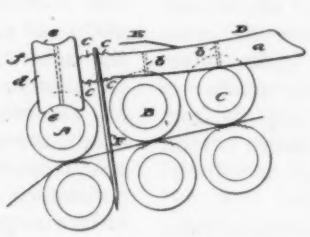


FIG. 2.

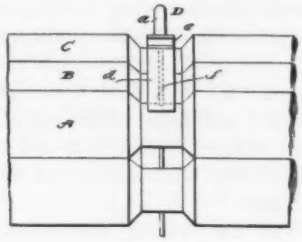


FIG. 3.

The saddle-body, D, is formed of one piece and comprises a longitudinal portion, a, adapted to bear on the rear wall, C, and having ducts, b, at intermediate points in its length for supplying the rear and middle rolls with lubricant and also having seats, c, in the lower and upper edges of its forward portion for the adjustable connection of the rod, F. There is also a head, d, extending in opposite directions from the forward end of the longitudinal portion and having concave bearings, e, at its ends and also having a lubricant-duct, f, extending throughout its length and between the bearings.

The spring, E, is fixed at one of its ends to one edge of the longitudinal portion, a, of the body, D, at an intermediate point, and is arranged, as shown, so as to exert pressure on the middle roll, B, when the saddle is in the position shown in Fig. 1, and leave the middle roll free from pressure when the saddle is reversed, or in the position shown in Fig. 2.

The pressure can be removed from the middle roll by simply reversing the saddle, turning it on its axis from the position shown in Fig. 1 to the position shown in Fig. 2; when this is done the spring, E, is placed uppermost and away from the middle roll. When, on the other hand, it is desired to subject the middle roll to weight or pressure, the saddle can be readily restored to the position shown in Fig. 1, with the spring, E, bearing on the middle roll.

GUT CORDS FOR TEXTILE WORK.

An advertisement in this issue calls attention to the gut cords manufactured by M. W. Wentworth, 45th St. and Centre Ave., Union Stock Yards, Chicago, Ill. These cords have been thoroughly tested in a number of mills and found well adapted to a wide variety of uses, such as harness straps, jacquard cords, driving shuttle motions on narrow fabric looms and for driving machinery where round belting is required. These cords combine great strength wearing qualities and flexibility. They have recently been subjected to a test in one of our leading textile schools and are reported to be very serviceable as a substitute for harness straps.

Further information can be obtained upon application to the manufacturer, who is prepared to fill orders promptly and will welcome trial orders from manufacturers desiring to test the new cord.

Dyeing, Bleaching, Printing, Etc.

DYEING OF SULPHUR COLORS WITH SODIUM SULPHIDE.

BY LOUIS J. MATOS, Ph. D.

While sodium sulphide has been known and used for many years in the chemical industry, it is only since the development of the special class of dyestuffs known as the "sulphur colors" that its use has considerably extended. It is confidently expected that as the sulphur color group of colors extends, so in proportion will the manufacture and use of sulphide extend, even in view of the number of attempts that have been made to produce a sulphur color that would not require the use of sodium sulphide in the dye bath.

A brief statement as to what sodium sulphide is may not be out of place. It is the result of combining sodium and sulphur under suitable conditions, the commercial product being of rather indefinite composition, due to the fact that there are a number of sodium sulphides, differing but slightly from each other, so that it would be more correct to say that the commercial article is a "polysulphide."

The historically important sulphur color requiring sodium sulphide as a necessary assistant in dyeing is Vidal Black, and from the date of its introduction, the question of the use of sulphide has been constantly before the dyer. At one period, and only a few years ago, much stress was laid upon the injury consequent to the use of sulphide in dyeing cotton, but after many experiments by various investigators, it is now regarded that sulphide is without the terrors formerly ascribed to it.

Owing to the peculiar composition of the various sulphur colors now in use, it is necessary to add to the dye bath some substance that will decompose the dyestuff in solution, and at the same time set free the color proper, so that the neutral salts also in the dye bath will perform their duty, and aid in the dyeing proper. Sulphide is found to answer the requirement more satisfactorily than any other chemical, principally because it can be readily and cheaply obtained, and further on account of its non-injurious action upon pure cotton.

In the early days of sulphur color dyeing, when the fierce cry of "tendered yarn" was heard upon every hand, it was found that there were several causes that led to the difficulty (for no one could be blind to the fact that some yarn was defective). After many trials, it was discovered that the sulphide alone could not weaken the fibre; also that the dye was without action, so that it became necessary to see the defect in either the process of dyeing proper, or in other places.

In the earlier colors, it was the general custom to fix the dyed color upon the dyed material by means of dilute acid, and here was at once an index pointing to the trouble, and so it proved. It was found that unless this acid was completely removed from the yarn, either by thorough washing or by careful neutralizing with an alkaline soap or alkali alone, the remaining traces would gradually disintegrate the fibre.

Another cause was traced to the presence of free sulphur, that is, uncombined sulphur in the dyestuff, that made its appearance as a scum soon after the dyeing operation would start. The boiling of the bath would cause the finely divided sulphur to become lodged within the twists of the fibres or threads with the result that they would resist even strong washing, and eventually oxidize and destroy the dyed material. Naturally this was very annoying to the dyer, who was really powerless to overcome the difficulty until a later day when new light was thrown on the subject.

At the present time no difficulty is encountered either during dyeing, or afterwards, and this is due to a better understanding of the proper treatment of the sulphur colors, the essential points of which are the following: (1) To employ in the dye bath no more sulphide than the particular dye being used

calls for. These quantities have been very carefully determined both by calculation and experiment for each dye, and a formula applicable to one may not yield satisfactory results when applied to another. (2) Wash thoroughly after dyeing. This means to continue the washing until every trace of soluble matter is removed. (3) Where the dyed material is afterwards to be treated with either an acid bath, or in a bath of a neutral or slightly acidified metallic salt, the final washing should be most thorough.

Keeping in mind these points, the use of sulphide has absolutely no disadvantages. Its special object is to keep the dyestuff always in solution during the boiling and dyeing, and a proper quantity is necessary in order that the bath may remain clear. If a sufficient quantity is not present, a precipitation of very finely divided particles of insoluble color may occur, readily detected by placing a few drops of the dye liquor on a piece of white filter or blotting paper. Should a distinct precipitate be observed, then a further addition of sulphide has to be made.

Sulphide plays a very important part in restoring a sulphur color dye bath to its normal condition, particularly after too prolonged boiling or after a period of disuse. In either case there is present the result of oxidation in the form of a fine precipitate that must be brought into solution before dyeing can proceed.

The use of an excessive quantity of sulphide has the peculiar property of entirely neutralizing the dyeing affinity of the color, so that the resulting shades are thin and hungry looking. This defect can be overcome only by removing a portion of the dye bath, and replenishing with all the ingredients except sulphide.

Commercially there are two forms of sulphide, one in crystal form, and the other in solid masses, being fused and sold in drums. As a rule nearly all published formulas relating to the sulphur colors are based upon the use of the crystal sulphide, and which is very nearly half the strength of the fused; its chemical formula is $Na_2S.10H_2O$, corresponding to 69.77 per cent. of water, and 30.33 per cent. of Na_2S (sulphide). The crystal variety readily takes up moisture from the atmosphere, and very quickly, if it is stored in a damp or steamy dye house, the result being that two portions are found in the container; viz., a solid mass and the "melted," the latter, if tested, will be found to contain more sodium sulphide than the remaining crystals.

It is proper to introduce a few notes upon the effect of the other usual ingredients of the dye bath upon the sulphide. Soda ash is added to keep the bath alkaline, for without it, a gradual formation of the sulphur acids would occur, ultimately decomposing the remaining dye, and stopping the dyeing. Caustic soda is used for the same purpose, and as a general rule the end results are the same. Common salt and Glauber's salt have no action on the sulphide, their use is solely to promote the exhaustion of the dye bath up to the absorbing power of the cotton. Formerly, there was no uniform standard or basis upon which to work in calculating the quantity of either of the two salts necessary for proper dyeing, but it is now pretty generally agreed that the specific gravity of the dye solution for blacks should be from 1.045 to 1.06 when cold. Many formulas for the sulphur colors indicate that either common or Glauber's salt can be used interchangeably, and this is true, but to secure uniform results, the exhaustion value of each of them must be considered, viz.: 10 parts of common salt can replace 12 parts of calcined Glauber's salt, or 24 parts of the crystallized Glauber's salt.

The following formulae from various sources are characteristic of the various combinations in which sodium sulphide is used.

For 100 pounds raw cotton:

BLACK.

Dye bath, 160 gallons of water.

Common Salt	60 lbs.
Sodium Sulphide	8 to 10 lbs.
Dyestuff (Immedial Black G Extra)	16 to 20 lbs.
Soda Ash	8 lbs.

For 100 pounds raw cotton:

BROWN.

Volume of bath, 160 gallons.

Common Salt	40 to 80 lbs.

Sodium Sulphide	4 to 8 lbs.
Dyestuff (Immedial Brown B)	8 to 16 lbs.
Soda Ash	4 to 8 lbs.

For 100 pounds cotton yarn:

Volume of bath, 300 gallons.

Common Salt	50 lbs.
Sodium Sulphide	10 lbs.
Autogene Brown	10 lbs.
Soda Ash	5 lbs.

This is for a rather full shade. If a lighter shade is desired, proportionately less of each component of the bath is required.

In using sodium sulphide some special precautions are necessary, but which have no reference to the dyeing operation. In the first place sulphide is a violent depilatory, that is, it acts quickly and injuriously upon the skin, so that it is necessary that those who work with the dyeing solutions have their hands protected by means of rubber gloves. Should some of these solutions be accidentally splashed in the eyes, the prompt application of large quantities of water will usually remove the trouble.

A source of trouble is the corrosion of brass, copper and bronze fittings wherever such solutions are used; this is due to the formation of copper sulphide, so that it is necessary that all fittings, such as pipes, valves, plugs, faucets, etc., that are likely to come in contact with the sulphide liquors, be made of iron. This point has been insisted upon by every house selling the so-called sulphur colors, but it is safe to say, that every textile plant where there is a dye house in which the sulphur colors were once used, have at one time or another carted to the scrap pile a jigger or other machine that was ruined by an unconscious disregard of the foregoing injunction.

Where large quantities of sodium sulphide are used, it is the best plan to have a large iron tank in which to dissolve the contents of one of the commercial drums at a time, and in which a standard stock solution can be made and kept to be drawn off as wanted. This large dissolving tank should have a cover to keep out the usual dyehouse dirt. Smaller solutions can be made conveniently in a strong cask.

It is not desirable to weigh the sulphide directly in an ordinary scale pan and then throw it into the dye bath.

DYEING YARN ON COPS.

A French cop dyeing machine shown in the accompanying drawings, has recently been patented in this country. It is described by the inventor as follows:

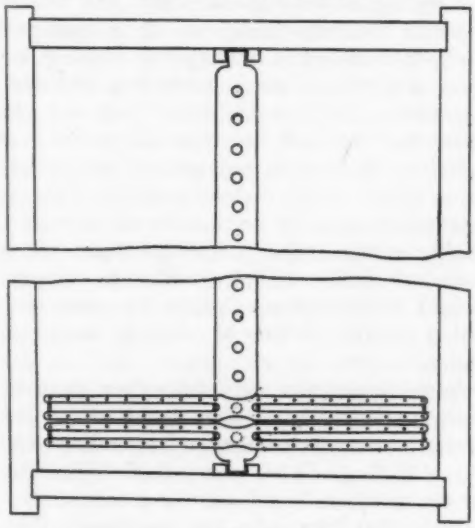


FIG. I.

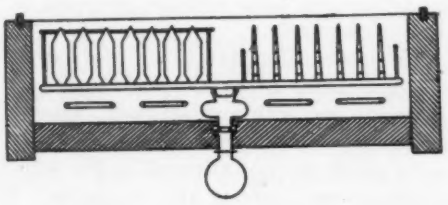
The cops to be dyed are mounted on hollow perforated spindles permanently fixed on the pipes conveying the dye-bath. These pipes are connected in sets of four by means of a union which connects with a central conduit running from one end of the vat to the other. This central conduit is movable and is detachably connected, by means of lower tubes, to another conduit fixed on the bottom of the vat. The spindle-carrying pipes thus form a sort of rack with the central feed-conduit and may be removed as a single piece. In this manner the handling is extremely simple, resulting in a saving of labor and efficient working of the vat. Further, by this invention the cops when placed on the spindles cannot be displaced or lifted by the pressure of the liquid, because they

are held by means of strips, which prevent their lifting.

Fig. 1 is a plan view, and Fig. 2 a transsection, of the vat; Fig. 3, an elevation, on an enlarged scale, of the end of a pair of tubes; and Fig. 4, a plan view of this end.

When the spindles have been fitted with cops or pirns and the whole is placed in the vat and the lid fixed, the vacuum pump is set in operation. The dye-bath is then drawn into the vat by the pipe, the conduit and the perforated spindles through the cops or pirns. By opening the air-tap pressure is re-established in the upper part of the vat, and the dye-bath redescends by gravitation. The operation may be repeated several times if necessary. Washing may be done in the same manner. The liquid may also be caused to circulate in the vat by means of a pump.

FIG. 2.



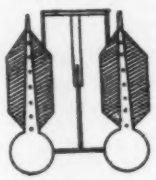


FIG. 3.

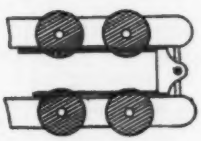


FIG. 4.

When the operation is terminated, the conduit and all the pipes, carrying the spindles with their bobbins, are removed in a single piece, and the vat is provided with a fresh set of pipes carrying spindles, which has been prepared outside the vat. From this it is evident that the operations in the vat may succeed one another without interruption other than that necessary for removing one set of spindle-carrying pipes and replacing it by another; this operation is facilitated by the fact that all the pipes are mounted on the central conduit, so that they may be simultaneously removed. The cops may be dried on the spindles by sending a current of warm air under pressure through the central conduit and forcing it through the cops.

HINTS TO YOUNG DYERS.

BY HENRY BAYER.

A person, whose taste and occupation drifts to the mysterious tinctorial art, finds in all his experience, that the dyer of a mill is the Alpha and Omega of almost all imperfect work.

There are a good many things that relate to a dyer's success with which the dyer has nothing to do whatever and for which he is not at all responsible, yet the manner in which these things are done affects directly the quality of his work.

Many dyers are blamed for poor colors and uneven work when the blame should rest on the overseers who have charge of the goods before and after they are in the hands of the dyer.

One of the most essential points is the cleanliness of the stock or goods to be colored, also the freedom of acids and alkalies, judging from what dyestuffs are to be applied to the fabric or stock.

It is seldom that a dyer gets an exact match on a new shade without a little feeding. The fabric he dyes, or the dyes and drugs he uses, may vary from the previous trials and what was used on the samples submitted to him. The practical dyer will readily see if he needs to add any or all of the original colors.

A dyer should have a good practical knowledge of acids and alkalies, making a study of their uses in the dyehouse and also in the wet finishing, as it is necessary for him to know when he is receiving inferior work.

The finisher and dyer of a mill should work in harmony to get the best results, and by careful consideration of the difficulties that arise in their respective departments they will be apt to overcome them more readily. It is necessary for the dyer to study baths and methods of dyeing, and use a suitable and practical method. Low acidity and high temperature are needed on some goods, while the reverse is required for other goods.

All formulas should be handled carefully

and systematically. My advice to the dyers is: Be sure you are right, then go ahead. Be cautious in making changes on formulas. Don't be a plunger. Be careful and accurate in all your weights. If you make a mistake, tell the superintendent at once and relieve your mind. Keep the production up in quality as well as quantity. Strive to improve your methods. Energy will accomplish anything that can be done in this world.

AN IMPROVED PROCESS FOR COLORING LOGWOOD BLACK.

A process to increase the depth of shade of logwood black has recently been patented in Italy by Lepetit, Dollfus & Gansser, Milan. The inventors claim to have discovered that the depth of shade obtained with logwood black is greatly increased by the addition of a solution of magnesium sulphate to the dyebath. In describing the process the following recipes for black on cotton and wool are first given.

Black on Wool. This is obtained by mordanting with 3 per cent. of bichromate of potash, 3 per cent. of blue vitriol and 1 per cent of sulphuric acid, then coloring with 7 1/2 per cent. of dry logwood extract.

Black on Cotton. A bath with 5 per cent. of dry logwood extract based on the weight of the cotton is prepared and the cotton boiled for one hour and left standing over night in the liquor. In the morning it is run through squeeze rolls to remove the surplus liquor, and treated for one-half hour in a cold bath containing 2 1/2 per cent. of blue vitriol based on the weight of the goods. It is then rinsed, extracted and again returned to the logwood bath in which it is left one hour, then wrung out and treated as before with a blue vitriol solution and colored again for one hour with an addition of 1 per cent. of soda, next wrung out and treated for one-half hour in a cold copperas solution. Finally it is boiled for one-half hour in the logwood solution with the addition of 1 per cent. of soap. It is claimed that the addition to the bath of 15 to 20 per cent. of magnesium sulphate based on the weight of the logwood gives a much deeper shade.

HALF FULL DISCHARGES ON WOOL.

For the discharging of dyeings on wool it has hitherto been customary to use either a salt of tin or hydrosulphite-formaldehyde and zinc powder. MM. Heilmann and Battegay, in a note to the Mulhouse Society, draw attention to the interesting action on dyed wools of sulphite of potassium, a salt used in calico-printing for half-discharge effects. They have made a series of experiments which indicate that certain acid colors are particularly sensible to the influence of this compound, evidenced after steaming by a more or less complete reduction of the color. For instance, domingo blue, dyed on wool and subsequently printed with sulphite of potash, yields a half-discharge effect by a single passage through the ordinary Mather and Platt. By steaming for one-half to three-quarters of an hour without pressure a full white is obtained.

This interesting fact brings forward useful possibilities of producing novel effects, for, by dyeing with a mixture of colors containing as a component part one or more colors which are not affected by the sulphite, various colored effects are attainable. Further, as there are many coloring matters reducible by hydrosulphite-formaldehyde, or a salt of tin (but sufficiently indifferent to the influence of sulphite of potash), it is possible by printing with the latter to produce either a white or colored discharge.

For example, by dyeing the wool with a mixture of domingo blue and a little cyanol, and printing on milling yellow along with the sulphite of potash, followed by a passage through the Mather and Platt, and subsequently washing in water acidulated with oxalic acid, a green discharge is obtained. The printing of hydrosulphite-formaldehyde gives a white. Sulphite of potash reduces and discharges the following colors among others: Domingo blue (Muhlheim), acid azo-red (Hoechst), ponceau 3R, tartrazine, wool scarlet 4B, etc. Three examples of printing pastes follow:

WHITE.

50 parts acetate of soda,
100 parts water,

250 parts British gum; when cold add
700 parts sulphite of potash 90 deg. Tw.

COLORED.

60 parts milling yellow O,
250 parts water,
200 parts British gum; when cold add
500 parts sulphite of potash 90 deg. Tw.
and
2 parts acid color (formyl violet S4B, cyanol, etc.),
100 parts water,
500 parts British gum; when cold add
400 parts sulphite of potash 90 deg. Tw.

DETERMINATION OF SILK WEIGHTING.

Determinations of this nature require first to take into consideration the compounds usually employed for this purpose. Knowing these, however, does not always lead to definitely conclusive results; for, with the introduction and adoption of newer methods, along with the use of other salts, the necessity for constant alertness is always present. On white and light-colored silks there is usually found—and certainly should be sought—either singly or in combination, the salts of alumina, tin, phosphoric acid, antimony, tannin, ferrocyanides, lead, oxides of iron, and silicic acid. On the other hand, for darker colors and blacks, the compounds mentioned, besides tungsten, sugar, oil, and glue, may be looked for.

For a rapid and preliminary determination of the question whether a white silk has been weighted with a salt of alumina or tin, it usually suffices to dye a small portion of the pattern in a bath of alizarine containing a small quantity of chalk. By introducing into the dyebath at the same time a small piece of comparatively pure silk, the difference in shade between the two patterns after dyeing affords definite indication, especially after washing and soaping, which of the two compounds has been used for weighting the sample under consideration. The unweighted silk will be dyed a bright pink, whereas silk weighted with tin acquires, with the same treatment, a lively pink, more or less intense according to the amount of tin on the pattern. On the other hand, silk charged with salts of alumina becomes dyed a scarlet, regulated likewise in its intensity by the proportionate amount of alumina present. Again, if a mixture of these two salts has been used for weighting, the tone of the pink, scarlet, or red produced serves with practice to indicate approximately not only the quality but also the quantity of either or both of these weighting materials.

For the quantitative determination of the weighting on silks, its value may be calculated from the amount of nitrogen contained in a sample, since one part by weight of nitrogen corresponds to 5.455 parts of fibroine or pure silk. As many of the compounds used for weighting contain variable quantities of this element, it is necessary first to remove completely all such foreign substances.

For the analysis of weighted colored silks, a small piece of the pattern should be carefully dried at a moderate temperature, accurately weighed, and treated for two hours in a boiling soap solution containing about 4 ozs. per gallon.

The effect of this treatment, both as regards any alteration of the color of the sample and the coloration imparted to the soap solution, should be observed and noted. The same pattern is then further treated in a boiling solution of carbonate of soda 2 deg. Tw., with the object of removing any ammoniacal salts that may yet be attached to the silk. Boiling for 1/4 hour will suffice for this purpose, followed by washing, drying, and subsequent titration of the amount of nitrogen contained in the now comparatively pure silk. For this estimation the dried pattern is immersed in a cold solution of concentrated sulphuric acid, to which is added a small quantity of anhydrous sulphate of copper. It is allowed to remain therein for from 4 to 6 hours—until the liquid becomes quite green.

The mixture is then warmed gently, a few crystals of permanganate of potash are added gradually, and the heating is continued until the solution turns to an intense green. The whole is then allowed to cool—a process that may well be hastened by the cautious addition of a small quantity of cold water. The whole may then be transferred

to a distillation apparatus and be rendered alkaline by the addition of pure caustic soda. By distillation all the ammonia is disengaged, and may be collected in a known quantity of standard sulphuric acid for estimation by simple titration with standard alkali. The amount of ammonia absorbed by the acid is easily arrived at by deduction, and from the factor thus obtained the quantity of nitrogen may be readily calculated, and thence the amount of pure fibroine in the sample.

The determination of black weighted silks requires for its successful issue a different procedure of analysis, owing to the possibility that always exists of some salts being fixed on the fibre in a state resisting the influence of the alkalies. The weighed sample is heated to 140 deg. F. in a 1 per cent. solution of hydrochloric acid. In most instances the solution will acquire a more or less deep red coloration, indicating the coloring matter employed—logwood. This process of extraction is repeated with fresh solutions of acid, until a solution be obtained which is only faintly colored pink. The pattern is then washed and immersed for about an hour in a 2 per cent. solution of carbonate of soda. The treatment is repeated with fresh solutions until a portion of the solution gives no coloration of Prussian blue with salts of iron. The pattern is then treated for 1 1/2 hours in a boiling soap solution, 4 ozs. per gallon, and is washed thoroughly and dried. The nitrogen may then be estimated by the method already indicated. Having ascertained by these methods the total percentage of weighting compounds, their particular composition may be arrived at by a careful analysis of the first solutions, or of a fresh portion of the sample, in the usual manner.—The Textile Mercury.

ONE-DIP ANILINE BLACK.

It is often asserted that one-bath aniline black has two great faults, viz., that it is liable to turn green, and that it is not fast to rubbing. Both complaints are the result of improper procedure. The greening is due to the presence of traces of sulphuric acid, which has not been rinsed out. Few dyers are aware of the difficulty of getting rid of the acid entirely, or of the variety of disagreeable consequences that may ensue from its gradual action. As regards fastness to rubbing, one-bath aniline black is entirely satisfactory in this respect, if it is dyed upon perfectly clean and well soaked goods, so that the dye can penetrate, and if the dyeing and oxidation are done slowly and at a temperature not exceeding 60 degrees C. Thorough penetration is essential, and time must be allowed for it, especially with tightly twisted yarns. If most of the coloring matter is precipitated on the outside of the fibre, as is the case when the process is hurried by employing too much heat, or in any other way, it is sure to rub off more or less.

For the same reason, it is very inadvisable to attempt to cover other dyes with one-bath black. Penetration is impossible, as the fibre is already full of the dyes it is sought to hide, and the black, adhering superficially only, soon wears off. If one-bath aniline black is dyed, with due attention to penetration upon perfectly clean goods, it gives results that cannot be surpassed by any sulphur-black, either from the point of view of expense or from that of appearance and wear of the dyed goods.—Leipziger Faerber Zeitung.

BLEACHING WOOLEN GOODS.

MM. Thierry-Mieg et Cie., in a recently opened communication to the Mulhouse Society, give particulars of a cheap and quick process employed by them in which, replacing the jigger by a washing-machine, they do without the use of soap. For muslins their method comprises the following operations:

(1) The pieces are treated in the washer for half an hour in water, at 104° F., to which is added, for 6 pieces, 4 1/2 pounds of Solvay soda or its equivalent of soda crystals.

(2) Washed in a similar machine for half an hour at 104° F.

(3) Padded in a bath of bisulphite of soda 9° Tw.

(4) Steamed without pressure for three-quarters of a minute in a chest provided with rollers.

(5) Rinsed in cold water in the washer.

The pieces are then ready for chloring, instead of the older method of treating with stannate of soda. For flannels they use the jigger, as the rough treatment in the washing machine affects their quality.

(1) Two and one-half pounds soda crystals in water 104° F. for 6 pieces of flannel.
(2) Wash in lukewarm water.
(3) Eleven pounds soda crystals.
(4) Wash in lukewarm water.
(5) Bisulphite 9-10° Tw.

These methods seem to be characterized by two operations—the one by degreasing with soda instead of soap, and the other by steaming after treatment with bisulphite, instead of allowing to lie-off 24-28 hours. Muslin pieces, the one lot degreased by soaping and the other by soda, passed together through bisulphite, allowed to lie two days, washed, soured, and washed, give a white similar in either case.

For printing purposes the replacement of soaping by soda, owing to the possibility by the use of the former of forming calcium soaps in subsequent chloring, offers decided advantages, and the method of steaming after the bisulphite treatment gives the better whites.

Color Cards.

Tetrazo Sulphur Colors on Cotton Yarn; American Dyewood Co., New York City.

An elaborate folder containing samples of cotton yarn dyed with the Tetrazo Sulphur colors in eighty different shades, including black, blue, green, yellow and brown.

Rosanthrene; A. Klipstein & Co., New York City.

A folder showing seventeen samples of cotton yarn and piece goods dyed with different percentages of Rosanthrene O. R. A. B. Cb. and Violet.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 97.

Violet on Cotton Yarn.

Phenidine Violet 3 R on 100 lbs. cotton yarn. Prepare the dye bath with

¼ lb. Phenidine Violet 3 R.
(Walter F. Sykes & Co., 85 Water St., New York City.)
10 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Phenidine Violet 3 R gives desirable and fast shades of heliotrope.

Recipe No. 98.

Blue on Cotton Yarn.

Nile Blue B N on 100 lbs. cotton yarn. First mordant the yarn with tannic acid by entering into a warm tannin bath made up with

2 to 3% of Tannic Acid

or a corresponding amount of a stainless sumac extract, and allowing it to steep in the gradually cooling bath for several hours, or over night.

Wring without rinsing and then work for 20 minutes in a cold bath containing

1½% Tartar Emetic,

then wash and dye in a bath made up with

1 lb. Nile Blue B N.
(Continental Color & Chemical Co., 128 Duane St., New York City.)
1 lb. Acetic Acid.
3 lbs. Alum.

Enter yarn cold and gradually bring temperature to 130° F. and dye at this temperature for ½ to ¾ of an hour.

Nile Blue B N possesses very good fastness to washing and light and produces an exceptionally bright and desirable shade of blue.

Recipe No. 99.

Violet on Cotton Yarn.

Rosanthrene Violet on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Rosanthrene Violet.
(A. Klipstein & Co., 122 Pearl St., New York City.)
25 lbs. Glauber's Salt.
3 lbs. Soda Ash.
5 lbs. Soap.

Enter yarn at 180° F. and dye at a boil for one hour, then rinse and diazotize by working for ¼ hour in a cold bath made up with

1½ lbs. Sodium Nitrite,
8 lbs. Hydrochloric Acid,

then rinse and develop in a bath containing

1 lb. Beta Naphthol,

dissolved with

1 lb. Caustic Soda Solution 40° B.,

then wash and dry.

Rosanthrene Voilet gives an excellent shade of violet, which possesses good fastness to washing.

Recipe No. 100.

Blue on Woolen Cloth.

Compound shade on woolen cloth. Prepare the dye bath with

3½ lbs. Domingo Blue N.
½ lb. Brilliant Alizarine Green, No. 450.
(C. Bischoff & Co., 88 Park Pl., New York City.)
5 lbs. Formic Acid.
15 lbs. Glauber's Salt.

Enter at 140° F., bring slowly to a boil and dye at a boil for one hour.

Domingo Blue N and Brilliant Alizarine Green, No. 450, will be found very valuable in the production of compound shades on heavy woolen and worsted cloth.

Recipe No. 101.

Black on Cotton Yarn.

Katigen Black T X Extra on 100 lbs. cotton yarn. Prepare the dye bath with

First Bath.

12 lbs. Katigen Black T X Extra.
(Continental Color & Chemical Co., 128 Duane St., New York City.)
12 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
60 lbs. Common Salt.

Second and Succeeding Baths.

7 lbs. Katigen Black T X Extra.
(Continental Color & Chemical Co., 128 Duane St., New York City.)
7 lbs. Sodium Sulphide.
1 lb. Soda Ash.
10 lbs. Common Salt.

Enter at 180° F. and dye just below boil for one hour, keeping below the surface of the dye liquor as much as possible.

Katigen Black T X Extra is a very concentrated black and possesses excellent fastness.

Recipe No. 102.

Blue on Cotton and Wool Union Cloth.

Zambesi Black B H on 100 lbs. cotton and wool union cloth. Prepare the dye bath with

6 lbs. Zambesi Black B H.
(Berlin Aniline Works. 213 Water St., New York City.)
1 lb. Soda Ash.
30 lbs. Common Salt.

Enter at 140° F., bring to boil and dye at boil for one hour.

Zambesi Black B H when dyed directly gives a blue, but when diazotized and developed a black of excellent fastness. It should be noted that whereas this dyestuff colors the cotton perfectly it scarcely stains the wool even at a boil, a fact of much value in the production of certain color effects upon union cloth.

Recipe No. 103.

Brown on Cotton Yarn.

Direct Brown R on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Brown R.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
20 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Direct Brown R dyes very level and is fairly fast to light and acid. It may be afterchromed, which makes it exceedingly fast.

Recipe No. 104.

Pink on Worsted Yarn.

Brilliant Carmine on 100 lbs. worsted yarn. Prepare the dye bath with

½ lb. Brilliant Carmine.
(American Dyewood Co., 154 William St., New York City.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Brilliant Carmine will be found an excellent color for silk dyeing.

Recipe No. 105.

Red on Worsted Yarn.

Chrome Fast Red R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Red R.
(Berlin Aniline Works, 213 Water St., New York City.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and after boiling ¾ of an hour add

4 lbs. Sodium Bisulphate

and boil ½ hour longer to exhaust the dye bath.

Chrome Fast Red R, when dyed directly, gives a bright full shade of red which, when after-treated with potassium bichromate and acetic acid, is somewhat dulled in shade but rendered faster.

Recipe No. 106.

Blue on Cotton Cloth.

Zambesi Black B H on 100 lbs. cotton cloth. Prepare the dye bath with

6 lbs. Zambesi Black B H (10 for starting bath).
(Berlin Aniline Works, 213 Water St., New York City.)
1 lb. Soda Ash.
30 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Zambesi Black B H when dyed directly gives a blue which when diazotized and developed will give a black of excellent fastness.

Recipe No. 107.

Scarlet on Cotton Yarn.

Diamine Fast Scarlet 4 B on 100 lbs. cotton yarn. Prepare the dye bath with

2½ lbs. Diamine Fast Scarlet 4 B. (standing bath).
(Cassella Color Co., 182 Front St., New York City.)
½ lb. Soda Ash.
20 lbs. Glauber's Salt.

Enter yarn at 180° F. and dye at a boil for one hour.

Diamine Fast Scarlet 4 B is distinguished by its very good fastness to washing and acids, also by its fastness to light which is superior to that of the ordinary direct cotton reds.

In union dyeing it has the advantage of staining the wool but little, and is at the same time sufficiently fast to acids to permit of cross dyeing with acid colors in an acid bath with the addition of 5 to 10 lbs. of alum.

Recipe No. 108.

Green on Woolen Cloth.

Compound shade on 100 lbs. woolen cloth. Prepare the dye bath with

3 lbs. Domingo Blue N.
3 lbs. Brilliant Fast Acid Yellow G A.
(C. Bischoff & Co., 88 Park Pl., New York City.)
5 lbs. Acetic Acid.
15 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil and dye at a boil for one hour.

Domingo Blue N and Brilliant Fast Acid Yellow G A will be found very valuable in the production of compound shades on heavy woolen and worsted cloth.

Recipe No. 109.

Orange on Cotton Yarn.

Tetrazo Orange P Y on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Tetrazo Orange P Y.
(American Dyewood Co., 154 William St., New York City.)
30 lbs. Common Salt.

Enter yarn at 180° F. and dye at a boil for one hour.

Tetrazo Orange P Y gives an excellent shade of orange, which possesses the characteristic properties of the direct cotton colors.

Recipe No. 110.

Yellow on Cotton Yarn.

Direct Yellow G on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Direct Yellow G.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
2 lbs. Phosphate of Soda.
2 lbs. Soap.
10 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Direct Yellow G is a very level dyeing color and exceedingly fast to light. In combination with Paranol Fast Direct Blue B it produces very fast and bright shades of green.

Recipe No. 111.

Blue on Woolen Cloth.

Domingo Blue N on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. Domingo Blue N.
(C. Bischoff & Co., 88 Park Pl., New York City.)
5 lbs. Formic Acid.
15 lbs. Glauber's Salt.

Enter at 140° F. and dye at a boil for one hour.

Domingo Blue N will be found an excellent self color, as well as valuable for the production of compound shades upon heavy woolen and worsted cloth.

Recipe No. 112.

Orange on Cotton Yarn.

Rosanthrene O on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Rosanthrene O.
(A. Klipstein & Co., 122 Pearl St., New York City.)
25 lbs. Common Salt.
3 lbs. Soda Ash.
5 lbs. Soap.

Enter yarn at 180° F. and dye at a boil for one hour, then rinse and diazotize by working for ¼ hour in a cold bath made up with

1½ lbs. Sodium Nitrite,
8 lbs. Hydrochloric Acid,

then rinse and develop in a bath containing

1 lb. Beta Naphthol,

dissolved with

1 lb. Caustic Soda Solution 40° B.,

then wash and dry.

Rosanthrene O produces an even and bright shade of orange which possesses excellent fastness to washing.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Dalton. Work will start at once on erection of the new buildings for the Elk Cotton Mills, recently reported organized here. Capital stock is placed at $165,000. J. W. Bowett is president of the company; J. E. Satterfield, treasurer and M. C. Foster, buyer. They will manufacture ply yarns, 4/14, operating 8,000 ring spindles.

*Georgia, La Grange. The new building to be erected for the Elm City Cotton Mills, will be 454 by 104 feet, two stories high, one of the largest of its kind in this section.

*Georgia, Newnan. The new cotton mill in which W. C. McBride has been mentioned as interested will be known as the McIntosh Mills. The company will be incorporated with capital stock of $150,000, with W. C. McBride, president and W. A. Steed, secretary and treasurer. The plant will be equipped with 10,000 spindles for making fine white black and colored yarns. It is expected that work on construction of buildings will begin in about 60 days.

*Mississippi, Batesville. The Batesville Yarn & Cordage Co. has been incorporated and will soon have plant running.

*New York, Le Roy. The Le Roy Cotton Mills, reported incorporated recently, with $200,000 preferred and $200,000 common stock, are now making alterations and installing equipment in the American Malting Co.'s plant, to be utilized. They will manufacture black and white twist yarn, operating 10,000 ring spindles. Myron C. Taylor is president of the plant, P. T. Jackson, Jr., treasurer and Manning Emery, Jr., agent. A dye house will also be attached. Operations are expected to start in October.

*North Carolina, Belmont. Work is being pushed on the new plant for the Imperial Cotton Mills. This will be a three-story building and structure is up to the second.

*North Carolina, Charlotte. The Mayes Manufacturing Co., recently reported incorporated with capital stock of $100,000, will start building their new plant in August. This mill will be equipped with 6,376 ring spindles, which will probaby be doubled, for making combed and carded yarns, 40s to 60s, using electric power. They expect to have the plant ready to start operations Jan. 1st. J. H. Mayes is president of the company; L. A. Dodsworth, treasurer, and J. L. Mayes, superintendent. Product will be sold direct.

North Carolina, Concord. The foundation is being laid for the Cannon Cotton Mill No. 4. This plant will be built about four miles from the city on the Southern Railroad.

*North Carolina, Fayetteville. The Victory Manufacturing Co., capitalized at $200,000, will start work this month on erection of their new buildings, which they propose having equipped and ready to start operations by November 1st. H. W. Lilly is president of the company; Fletcher M. Cook, treasurer and N. D. McNeill, superintendent. They will make print cloths, and will have an equipment of 25,000 mule spindles and 800 looms, using electric power. Product will be sold direct. Have not yet contracted for any of the equipment.

*North Carolina, Gastonia. All the contracts are reported awarded for the Clara Manufacturing Company's new building, which will be 267 by 80 feet.

*North Carolina, Lattimore. J. P. Dillinger and W. T. Carlton are interested in the Pink Manufacturing Co., recently incorporated to operate a cotton spinning and weaving plant.

North Carolina, Mooresboro. The Elizabeth Manufacturing Co. has been incorporaed with capital stock of $60,000, for purpose of manufacturing cotton yarns and cloth. Among those mentioned as interested are D. B. McBrayer, C. M. Cooke, Jr., and S. S. Royster.

*North Carolina, Selma. S. W. Cramer of Charlotte, N. C., is preparing plans and specifications for the new plant to be erected by the Lizzie Cotton Mills, of which M. C. Winston is president. This mill will be equipped with 10,500 spindles for making yarns. It is expected to have same completed and in operation by Jan. 1st.

*Pennsylvania, Milton. The Milton Weaving Co. has started operation in their new plant, making tapes and lamp wicks, with equipment of 17 looms. Plant is operated by electricity. Company is capitalized at $10,000 with John P. Hackenberg, president; H. R. Frick, treasurer. Will sell direct.

Pennsylvania, Philadelphia. The Industrial Mills Co. is the name of a new corporation with a capital of $100,000, which is about to start up in the manufacture of silk, cotton and mercerized narrow fabrics, giving special attention to plain and fancy spool tapes. The company has secured quarters in the Davenport Mills at the S. E. corner of Mascher and York Streets, which they will install with 20 looms. The machinery is now coming in and it is their expectation to be in full operation by the 1st of July. The company starts their new enterprise with a bright outlook for success and with orders already coming in for their production. The officers are Mr. W. A. Dickel, well known in this city as a manufacturer of carpets, as president and treasurer, and Ivan B. Scovill, who has had many years' experience in this line of manufacture, as vice president, general manager and superintendent. Both Mr. Dickel and Mr. Scovill will do the buying for the plant.

*Rhode Island, Pawtucket. The Solway mills of Westerly, R. I., are to be consolidated with the Ingrahamville Dye Works at this place and will be removed here about December when the new building to be erected will have been completed. Plans are being drawn for a four-story brick building, 150 by 60 feet, and a weave shed, 150 by 150 feet. William Halliwell, manager of the Dye Works, will be president and general manager of the new concern.

South Carolina, Rock Hill. At meeting recently held by directors of the Aragon Cotton Mills, Alexander Long was elected president and treasurer of the company, and Ira B. Dunlap, secretary. Work will soon start on erection of the new buildings, etc.

Enlargements and Improvements.

Alabama, Eufaula. Work will start at once by the Eufaula Cotton Mills, installing 10 new (Pettee) cards and 6 drawing frames. They also propose adding 32 more looms.

Georgia, Dalton. The Crown Cotton Mills are reported to double capacity of the plant.

Maine, Westbrook. The Dana Warp Mills are building a brick addition, 30 by 50 feet, three stories.

Georgia, Monroe. It is reported that the Walton Cotton Mills will expend about $50,000 enlarging their mills. They propose doubling the present capacity of the plant (5,000 spindles).

Maine, Biddeford. The Pepperell Mfg. Co. is to install 1,000 new Draper looms in the plant.

Massachusetts, Easthampton. The Nashawannuck Company is to increase the capital stock to $500,000. A new addition is proposed.

Massachusetts, Easthampton. An addition, 24 by 36 feet, 2 stories, is to be built to the finishing department of the Glendale Elastic Fabric Company's plant. The building now occupied by the company's offices will be used for a warehouse.

Massachusetts, Easthampton. The Nashawannuck Manufacturing Company is to build an addition, 150 by 46 feet, and will add new machinery.

Massachusetts, Fall River. The Davol Mills are installing the American Moistening Company's system of air moistening.

Massachusetts, Fall River. An addition, one story, 62 by 77 feet, is being built to the Sagamore Mfg. Co.'s No. 2 mill, to be used for accommodating additional speeders.

Massachusetts, New Bedford. The Bristol Mill is reported to install 25,000 additional spindles in the plant.

Massachusetts, Worcester. The Wachusett Mills are to instal additional machinery, doubling present output. Plans are being made for an addition to be built to the factory.

*New Hampshire, Nashua. Brick work has begun on the new mill under way for the Nashua Manufacturing Co.

*North Carolina. Asheville. All contracts have been awarded for the new bleachery to be built for the Elk Mountain Cotton Mills, and work will be pushed to completion.

*North Carolina, Charlotte. The Highland Park Manufacturing Co. has recently installed 400 new looms in their No. 3 mill. The capacity of the plant is 30,000 spindles and 2,000 looms.

North Carolina, Graham. The Bellemont Cotton Mills have let contracts for additional buildings to be erected and machinery to be installed.

North Carolina, Patterson. Additional carding, spinning and picking machinery is being installed in the Gwyn-Harper Manufacturing Co.'s plant.

North Carolina, Monroe. The Monroe Cotton Mill is installing new machinery, including a number of looms.

North Carolina, Rockingham. The Great Falls Manufacturing Co. are to instal additional (Howard & Bullough) spinning frames.

*North Carolina, Roxboro. Arrangements are being made by the Roxboro Cotton Mills to start construction work on new addition. A building 130 by 265 feet, with engine and boiler house, 50 by 100 feet, and warehouse, 50 by 100 feet, will be built.

North Carolina, Swepsonville. The Virginia Cotton Mills have awarded contract for an addition, 300 by 100 feet, one story, to their mill. They will eventually increase looms from 300 to 600.

North Carolina, Tarboro. The Tarboro Cotton Mills will soon instal new machinery in No. 1 mill.

Quebec, Montreal. The Dominion Textile Company is to erect a new building, 102 by 90 feet.

Pennsylvania, Philadelphia. The Philadelphia Tapestry Mills, Allegheny Ave. and Mascher Sts., have placed plans for one-story extension to their factory, 50 by 44 feet, in the hands of William Steele Co., who are now estimating on same.

Rhode Island, Pawtucket. The Providence Braid Co., now located at Providence, is to transfer their mill to this place, where a new building will be erected. They propose having same completed by fall.

South Carolina, McColl. The Marlboro Cotton Mills are equipping their mill with humidifiers, adopting the American Moistening Company system.

Tennessee, Knoxville. The Brookside Cotton Mills have awarded contract for erection of a new office building, upon which work will start at once.

Texas, Denison. The American Cotton Spinning Co. is to instal weaving machinery during the summer.

*Texas, Denison. The Denison Cotton Mills have placed order for 140 new looms, additional carding and picking machinery, and will instal same in the mills during July.

Texas, Sherman. It is reported that the Sherman Cotton Mills are to be enlarged.

Texas, Waxahachie. An addition is to be built to the Waxahachie Cotton Mills and the present capacity of the plant doubled.

*Texas, Waxahachie. Contract has been let by the Waxahachie Cotton Mills for the new addition to be built to the plant and which they propose having in operation by Dec. 1st. When completed the plant will have total equipment of 10,000 spindles and 204 looms, making flat duck. T. A. Ferris is president of this company, J. H. Miller, treasurer, E. A. Du Bose, secretary and manager and Thos. Howard, superintendent.

Mills Starting Up.

*North Carolina, Monroe. The Icemorlee Cotton Mills have started operations.

Mills Shutting Down.

New Hampshire, East Jaffrey. The White Bros. Cotton Mills at this place have been closed indefinitely owing to strike of the weavers.

New York, Newburgh. A recent report states that the cotton mill of the Garner Estate at this place will be sold, as the Estate proposes discontinuing permanently operating same.

Pennsylvania, Philadelphia. Samuel McKeaige's Dellwood Mills at Hancock and Somerset Sts., in which he operated 10 looms on upholstery goods, couch and pillow covers, is shut down. It is reported that the mill will not be started up again as it is his intention to retire. The equipment is for sale.

WOOLEN.

New Mills.

*Georgia, Rossville. The Peerless Woolen Mills have been incorporated with capital stock of $100,000, with W. H. Reddick as superintendent. This company has started work on the erection of a new mill for making cotton warp cassimeres and will equip plant with 2,000 ring spindles, 7,800 mule spindles, 10 sets woolen cards and 200 looms. Electricity will be motive power. A dye house will also be added. Goods will be sold direct. This is the new mill reported recently under Chattanooga, Tenn., in which J. L. Hutcheson's name was mentioned.

*New Hampshire, Newport. A new company will soon be incorporated to operate the plant recently mentioned as proposed in the old shoe factory. Seth M. Richards, F. P. Rowell, Sam D. Lewis, the latter to be addressed regarding the project, are interested. A plant of 4 sets and 40 looms will be built for manufacturing satinets.

Ontario, Markham. Gaunt & Jessop are now operating the plant formerly known as the Maple Leaf Woolen Mill, making meltons, serges, flannels, vicunas, carriage cloths, etc. The plant is equipped with 6 sets cards, 8 broad and 26 narrow looms, with dyeing and finishing departments.

*Ontario, Seaforth. The Seaforth Woolen Mills Co. has been organized to operate the woolen mill formerly run at this place by John Dick, Ltd. Company manufactures blankets, tweeds, etc., operating 2 sets cards, 14 broad looms, dyeing and finishing the goods. Product is sold direct.

*Oregon, Albany. The Bannockburn Mfg. Co. has been incorporated with capital stock of $200,000 to rebuild and operate the plant which was destroyed by fire. Charles Cooper is president of the company and H. M. Grant, treasurer. They will make superior fabrics for men's and women's wear, operating 6 sets cards and 30 looms. A dye house and finishing department will also be installed.

Pennsylvania, Philadelphia. Messrs. Riley & Schwartzer have started up a plant for the manufacture of men's wear in the Davenport Mills, Mascher and York Sts., where they are operating 10 looms, having taken over the equipment of the plant formerly operated by Edward Riley, formerly located in the same building, who is no longer in business. They are running at present on commission work.

Pennsylvania, Philadelphia. Scott, Potter & Howard is a new concern recently located in the Cope Mill, Wayne Junction, for manufacturing men's wear cotton worsteds, operating 22 looms. Later they propose making dress goods, serges and other lines in woolen and worsteds.

*Rhode Island, Manville. The Manville Worsted Company will soon start manufacturing its own warps, and greatly facilitate operations at the plant.

*Rhode Island, Manville. The Bateman Manufacturing Co. will start production of ladies' dress goods about July 1st. The details of the plant have not yet been entirely completed, nor has any of the equipment been purchased with the exception of some looms.

*Vermont, Ludlow. Operations will start Nov. 1st by the Jewell Brook Woolen Co., capitalized at $100,000. Geo. P. Levey is president of this company; Geo. W. Raymond, treasurer, and James S. Gill, superintendent. They will make overcoatings and cloakings, operating 4 sets cards and 24 broad looms. Goods will be dyed and finished at the mill.

Enlargements and Improvements.

*Connecticut, Stafford Springs. Work will start at once on erection of new weave shed for the Rhode Island Worsted Co., to remove from Indian Orchard, Mass. They will have an equipment of 6 sets cards and 200 looms when in operation, making woolen, cotton and worsted goods for men's wear. A dye house will be attached to the plant.

Georgia, Rossville. The Park Woolen Mills are reported to build an addition to their plant at cost of about $45,000.

Indiana, La Porte. The La Porte Woolen Mills are to double the present capacity of the plant. A new brick building, 200 by 70 feet, three stories and basement, and another addition, 20 by 70 feet, will be built. A new 250 h. p. engine and two large boilers will be installed, also a 1,000 electric light generator. When completed the plant will have capacity of 100 broad looms. It is expected to have the additions completed the latter part of the year.

Kentucky, Louisville. The Louisville Woolen Mills have been purchased by the Sweetwater (Tenn.) Woolen Mills, for $200,000. The equipment of the plant will be increased. Property will be operated under old name until present charter expires.

Maine, Lisbon Falls. The Worumbo Manufacturing Co. is building an addition to their finishing room.

*Massachusetts, Franklin. Work is progressing on the new building for the Franklin Yarn Mill. It is expected to have same completed by July 1st.

Massachusetts, Graniteville. The Abbott Worsted Co. is building an addition to the engine room. A new dynamo and reeling machinery will be installed.

Massachusetts, North Adams. The Broadley Mill at this place is being equipped for the Davies & Mahoney Spinning Company. This concern will continue running their mill at Pittsfield, until the middle of August or first of September, owing to the increased business.

*Massachusetts, Plymouth. The new weave shed for the Puritan Mills is about completed. The looms will be transferred to the new addition and 200 new Knowles looms added, making a total of 400. They will also put in 26 new spoolers. A rope drive will connect the main mill with new addition.

*Massachusetts, Rochdale. Work is well under way on the new building for the Rochdale Woolen Mills. The new building, which is to be 372 by 86 feet, two stories, is expected to be completed by Oct. 15. The first floor will be used for dyeing room, scouring and dry finishing, and the second floor for sorting wool and weaving.

New Hampshire, Enfield. An addition is to be built to the dye house at the Baltic Mills.

*Nova Scotia, Amherst. The Hewson Woolen Mills, recently reported to increase their capital stock, will erect a new addition in which they will manufacture men's underwear, in addition to wool tweeds and costume cloths, now made. They expect to have the new addition completed about December.

Pennsylvania, Bristol. Wm. H. Grundy & Co. have placed a repeat order for humidifiers with the American Moistening Company.

Pennsylvania, Philadelphia. The Rock Hill Mills, on Rock Road, near Belmont Ave., West Manayunk, recently destroyed by fire, with a loss of $25,000, will be rebuilt and equipped with new machinery and started up again on rug and blanket yarns as heretofore.

Pennsylvania, Philadelphia. The contract is about to be given out for a three-story addition, 12.7 by 10.4 feet, and a one-story addition, 28 by 12 feet, to the plant of T. Kenworthy & Sons, Roxboro, manufacturers of worsted and woolen carpet yarns.

Pennsylvania, Philadelphia. Plans are being prepared by Stearns & Castor, architects in the Stephen Girard Building, for extensive alterations and additions to the large factory of Thomas Wolstenholme & Sons Co., at Frankford Ave. and Westmoreland Sts., manufacturers of worsted yarns.

Pennsylvania, Philadelphia. The Salts Textile Co., who have recently purchased the equipment of George F. Bechman & Son, 69th St. and Haverford Ave. and who, we stated in a previous number, were seeking quarters in this city, have leased the eighth floor of the Fretz Building into which they will remove the machinery and start it up on plushes.

Pennsylvania, Philadelphia. George Carson, 2706 Hancock St., manufacturer of ingrain carpets on 36 narrow and 10 broad looms, has removed his machinery to the building formerly occupied by the Franklinville Rug Mills at 4600 North 6th St., which he recently purchased from the owner, David M. Stroud.

Pennsylvania, Philadelphia. The Louis Walther Mfg. Co., manufacturers of worsted dress goods, in the Fretz Building, 10th and Diamond Sts., are removing their plant to Indiana Ave. and A St., where they have leased one of the floors in the Hoyle, Harrison & Kaye Mill. Their new quarters being twice as large as those which they are now occupying has enabled them to double their equipment, adding thirty new looms, or eighty in all. They expect to be in full operation by July 1.

Pennsylvania, Philadelphia. Messrs. Taylor & Bro., formerly located on Mutter St. below Lehigh Ave., have removed their plant to 2739 N. Fairhill St., the old mill formerly occupied by the Armure Tapestry Co. They are equipped with 9 narrow and 6 broad looms, all of which are being run full time on men's wear and dress goods. They are about to place an order for several new looms, both narrow and broad, to enable them to get out their orders.

Pennsylvania, Philadelphia. The Saxonia Dress Goods Mills, operating 72 looms at Howard and Palmer Sts., have leased quarters at Howard and Montgomery Ave., which they have equipped with looms and are running as an annex.

*Rhode Island, Providence. Work has been started on the new mill, 306 by 76 feet, three stories, for the Wanskuck Company.

*Tennessee, Jefferson City. We have been advised by the Jefferson City Mills that they are making some improvements to the plant, by tearing down a small wooden addition and erecting a two-story brick building, 60 by 64 feet, on the site. This new addition will be used mostly for storage room. Will not add looms as reported.

Mills Starting Up.

*Delaware, Newcastle. Operations have begun in the Cromwell Woolen Mills, owned by M. Gambrill. J. H. Lord is superintendent of the plant, making men's suitings, all wool and cotton warp goods. This plant is equipped with 150 looms and 8 sets cards. Goods are sold through Wm. Burgess & Co., New York.

*Maine, Caribou. The Crockett Woolen Mill will soon be ready to resume operations, the work of rebuilding the plant destroyed by fire being nearly completed.

*Maine, Waterville. The Terry Manufacturing Company has been organized with capital stock of $100,000 to continue operating the plant formerly known as the Riverview Worsted Mill. Robert A. Latimer is president of the company; G. F. Terry, treasurer, and A. H. Terry, secretary. Arthur Ab-

bott is one of the directors. Preparations are being made for starting operations in about two weeks.

*Massachusetts, Plymouth. Some of the machinery in the new mammoth weave shed of the Puritan Mills has been installed and put in operation. The entire addition will soon be running.

New Mexico, Albuquerque. Operations have been resumed at the Rio Grande Woolen Mills.

Oregon, Eugene. The Eugene Woolen Mill has been purchased by Thos. Kay Co., of Salem, Ore., and is being operated as a branch mill.

*Oregon, Pendleton. The Pendleton Woolen Mills have been started by J. Sheuerman & Son, making Indian robes, blankets, shawls and couch covers. This plant is equipped with 2 sets cards and 11 looms and dye house. Product is sold direct.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*New York, Corning. Work will start in August on erection of the new building for the Merrill Silk Co., to manufacture silk gloves, with equipment of 200 sewing machines. It is expected to start running about September. Electricity will be used.

*Pennsylvania, East Plymouth. The Luzerne Silk Throwing Co. has started operations in their new plant. This company is capitalized at $300,000, with Ellis R. Simpson, president; Fred W. Bleckley, treasurer and A. H. Bleckley, superintendent. Commission throwing work is done. Plant is equipped with 15,000 spindles.

*Pennsylvania, Scranton. The Globe Silk Manufacturing Co., incorporated with capital stock of $50,000, will have the new plant ready to start operations about September 1st. H. J. Ziegler is president of the company; Louis Schumacher, treasurer. They will manufacture silk goods, 36 in. wide, operating 80 looms. Product will be sold through Boessneck, Broessel & Co., New York.

*Connecticut, Mystic. The Rossie Velvet Mill has been closed for a week for purpose of connecting the new addition recently built with the old plant.

New Jersey, West New York. A new building, 800 by 100 feet, one story, brick, will be erected by the E. H. Kluge Weaving Co., manufacturers of silk embroidery.

North Carolina, Charlotte. Work has been completed on the addition to the Stehli Silk Mill and new silk throwing machinery is being installed.

*Pennsylvania, Weatherly. E. Warner is president of the Onoko Manufacturing Co., recently reported having started plant here. R. E. Sendel, treasurer, and John Kidd, superintendent. This plant is equipped with 44 looms for making dress silks, using steam power. Product will be sold through Schefer, Schramm & Vogel, dept. Wendt Bros.

*Pennsylvania, Wyoming. Wm. Kelley is president of the Wyoming Silk Mfg. Co., and James Eagen, treasurer. This plant is equipped with 50 looms.

Enlargements and Improvements.

New York, Chadwicks. The Standard Silk Co. has placed their order for humidifiers with the American Moistening Company, Boston.

New York, Cortland. The Cortland Silk Company will soon start manufacturing flowered silk and ten looms will be installed for this purpose.

*Pennsylvania, Lenni Mills. The Daniel Lees Estate has removed the plant to Glen Riddle, instead of Chester, as was recently reported. The capacity of the plant has been greatly increased (50,000 yards per month), and they are now operating 40 looms on upholstery velours.

Pennsylvania, Philadelphia. The S. S. Fretz Mfg. Co., manufacturers of umbrella silks at 10th and Diamond Sts., have recently received the first installment of a large order of machinery which they placed abroad. The machinery just arrived will be used in the new finishing department which they are about putting in. The company has also made a $10,000 addition to their electric lighting and power department.

Virginia, Norfolk. The Norfolk Silk Mills are installing 87 new looms. The winding and warping departments have been removed to the basement to make room for the new machinery.

Mills Shutting Down.

*New York, Hornellsville. The Liberty Silk Co.'s mill has been closed. It is stated that the property will be sold and put in operation next fall.

Pennsylvania, Plymouth. Operations have been suspended indefinitely in the silk mill conducted by M. J. Atwood.

MISCELLANEOUS.

*Massachusetts, Lowell. Operations will be resumed next week in the Hamilton Print Works, which have been closed.

Massachusetts, North Adams. The Windsor Print Works have awarded contract for installing electric lights, of which there will be about 1,600, in the mill.

*Minnesota, Winona. Preparations are being made by the Union Fibre Co. to rebuild their plant recently destroyed by fire, with a new fireproof building. They expect to have same completed and in operation by October 1st.

New York, Binghamton. Operations are reported to be resumed in the Binghamton Linen Mills, which were closed about a year ago. Negotiations are now pending with New England parties to take management of the plant and it is thought will prove successful.

*Ontario, Welland. Work has been about completed on the new plant erected here by the Plymouth Cordage Co. of Plymouth, Mass.

Pennsylvania, Philadelphia. Messrs. A. B. Simoneau & Son have leased the first floor of 214 and 216 W. Dauphin St., where they have installed machinery for the beaming of plain and fancy warps.

Pennsylvania, Philadelphia. The Eureka Textile Printing Co. has been incorporated with Joseph Brucker, president, Fred. E. Schmidt, treasurer and Bethel Ware, secretary. The company, which has its office and works at 137 North 12th St., are printing cotton, silks, plushes, felts, etc., with a new process which promises to meet with much success. Plans are now being formulated by them for the increasing of their capital, after which it is their intention to move into new and larger quarters and commence operations on a larger scale.

Pennsylvania, Philadelphia. The Fairhill Bleachery, bleachers of cotton goods at 2803-5-7 Fairhill Street, report a very active business. They have recently put in a 2,500 pound "Hurricane" Dryer, supplied by the Philadelphia Drying Mch. Co.

Pennsylvania, Philadelphia. The demand for the work done by the William Lorimer's Sons Co., mercerizers and dyers of cotton yarns, has compelled them to increase their plant by adding another story to their building, 170 by 45 feet. This new floor will be used by them as a converting department. They are located at Ontario and Lawrence Sts.

*Rhode Island, Ingrahamville. Work has been started on erection of the new building for the Ingrahamville Dye Works. It is expected to have same completed by Sept. 1st.

Rhode Island, Providence. The James D. Minto Company has been incorporated with capital stock of $100,000 and will rebuild the Minto plant at North Providence, destroyed by fire some time ago. Among the incorporators are James D. Minto, James and Frank Cuthbertson and Geo. N. Nichol.

Rhode Island, Woonsocket. The Woonsocket Scouring & Carbonizing Co. is a new concern which will start operations shortly on Social St. James Gilet is manager of the plant, which will scour and carbonize wool and waste.

FIRES.

New York, Brooklyn. Explosion of a dynamo in the Chelsea Jute Mill caused damage to the plant to the amount of $10,000.

Ohio, Piqua. The Union Underwear Co.'s mill has been damaged by fire. The loss is estimated at about $10,000.

Pennsylvania, Philadelphia. The Quaker City Textile Mills, on Germantown Ave., have been destroyed by fire. The loss is estimated at $30,000. This plant was owned and operated by the Jos. H. Masland Co., making hammocks, school bags, etc., and up to the time of the fire was very busy.

Pennsylvania, Philadelphia. William O'Neill's Mill at Oxford and Josephine Sts., Frankford, was partially destroyed by fire June 7th. This plant was equipped with 86 broad and 58 narrow looms on dress goods, damasks, and cotton and linen goods, occupying part of the mill, the balance of the mill being occupied by Rhodes & Dyeson, manufacturers of art squares, 6 looms on the third floor, and William Johnys, operating 30 looms on men's wear in the basement. Mr. O'Neill recently started up a plant for the manufacture of rugs in the same building with 6 looms. It is estimated that the loss will be about $20,000.

Pennsylvania, Philadelphia. A fire caused by a spark from one of the carding machines in the Bolton Spinning Co., at Howard and Berks Sts., on Tuesday, the 12th of June, damaged the building and its contents to the extent of $10,000.

Pennsylvania, Reading. Lightning, during a heavy thunder storm, on the night of June 2d, struck and entirely demolished the Prospect Dye Works, entailing a very heavy loss to the owners.

Rhode Island, Pawtucket. The Union Wadding Company's plant has been destroyed by fire. The loss is placed at $75,000.

FACTS AND GOSSIP.

*Alabama, Demopolis. The loss to the Besse Minge Mfg. Co.'s plant was but $600, instead of $6,000 as reported. There was some damage to machinery, but most of it was done to stock.

Alabama, Tuskegee. C. W. Hare of this place is mentioned as interested in locating a cotton mill at this place on site which he will give for the purpose.

*Arkansas, Little Rock. We have been advised by the Board of Trade that a committee has been appointed to confer with certain cotton mill owners, who propose erecting a $400,000 mill in this city, provided $100,000 is subscribed locally. The proposition has been accepted and the interested parties have been invited to visit Little Rock.

*Canada, Toronto. The Dominion Novelty Mfg. Co., Ltd., which has been reported incorporated recently with capital stock of $50,000, is for manufacturing hose supporters, suspenders and outing hats.

*Connecticut, Central Village. We have been advised by Charles Bragg that there is no truth in recent report concerning the purchasing of a building to be utilized for a woolen mill by the above and other named parties.

Connecticut, Windsor Locks. The annual shut down of the mills using water in the canal, usually occurring during the first week in July, will not take place until the last of the month, July 29.

Delaware, Wilmington. The old Pickles Foundry, which has long been idle, a recent report has it, is to be leased to a company who will install it with machinery for the manufacture of ropes, etc.

*Georgia, Atlanta. The Atlanta Cotton Mills have been transferred to the Georgia Manufacturing & Realty Company.

*Georgia, Douglasville. The New Century Cotton Mills have been purchased at recent auction sale by Mitchell King, of Atlanta, Ga.

Georgia, Greenville. It is reported that a propo-

sition is under way for building a cotton mill at this place, provided the G. B. & B. Railroad is extended through this city.

*Georgia, Savannah. The Savannah Specialty Manufacturing Co., incorporated with capital stock of $5,000, Samuel S. Jones, secretary and treasurer, is in the cutting up trade, making from the piece, linen, silk and cotton handkerchiefs, etc.

*Georgia, Washington. A company is to be organized with capital stock of $1,000,000 to build a cotton mill to be operated by electricity. J. H. Fitzpatrick is actively interested in the project.

*Idaho, Boise. It is reported that the project of starting a knitting plant is proving successful and that the necessary capital stock has been subscribed.

Idaho, Pocatello. J. F. Lever, of Eureka, Cal., is reported as negotiating with the Commercial Club relative to establishing a plant in this locality.

*Kentucky, Hopkinsville. James Cates & Son Co. advise us that they are enlarging their flouring mill and will not commence work on their woolen mill until later.

Massachusetts, Becket. The partnership between Charles W. Mallison and Michael T. Galliher, operating as the American Braid & Novelty Company, has been dissolved. The business will be continued by Mr. Galliher.

*Massachusetts, Bondsville. We have been advised that any small additions being made to the Boston Duck Company's plant were contracted for long ago.

Massachusetts, Franklin. It is reported that a plant is to be established here by Arthur T. Parker, of No. Attleboro, for manufacturing shoe laces.

Massachusetts, Lowell. The Hamilton Manufacturing Co. is extending their system of humidifiers, the work being done by the American Moistening Company, Boston, Mass.

Massachusetts, Wilkinsonville. The Buttonwood Shoddy Mill, operated by the Estate of Samuel Prescott, has been sold to Peter Lynch of Woonsocket, R. I. The plant will be continued by Mr. Lynch in addition to his other business.

Minnesota, St. Paul. The International Flax Twine Co. has placed a large order for humidifiers with the American Moistening Company, Boston, Mass.

Missouri, Kansas City. The United States Ramie Fibre & Manufacturing Co. has been incorporated under New Jersey laws, with capital stock of $100,000, for purpose of growing and subsequently manufacturing ramie fibre, etc. Among those interested are L. A. Murphy, L. S. Jones, J. W. Farrar and L. D. Smith.

Missouri, St. Louis. The Elite Embroidery Manufacturing Co. has been incorporated with capital stock of $5,000 for purpose of manufacturing embroideries. R. A. Ellerman and John Hagen are among those interested.

New Hampshire, East Rochester. At recent meeting of the stockholders of the Cocheco Woolen Mfg. Co. Samuel Rindge was elected to succeed Benj. Phipps, deceased.

New Hampshire, Keene. Arrangements are being made by the Eastern Rug Manufacturing Company, a new concern, for making rugs from old carpets. C. H. H. Gilbert is interested in the enterprise.

New Jersey, Jersey City. It is reported that the Esmond Mills have been incorporated with capital stock of $300,000 for purpose of manufacturing linens, etc. Harry E. Danner and Preston M. Trull are among those interested.

New Jersey, Paterson. The Brilliant Silk Co. has been organized with capital stock of $900,000, and will continue the property of which J. B. Whitney was formerly sole proprietor. Among others interested are John W. Steward and Alfred Gartner.

New Jersey, Paterson. The Seal & Moore Co. has been incorporated with capital stock of $25,000, to continue the plant of Seal & Moore, manufacturers of broad silks.

New Jersey, Ridgewood. The Narragansett Manufacturing Co. has been reported incorporated with capital stock of $5,000 for manufacturing woolen and cotton goods. A. W. Gregory, W. W. Capers, Jr., and E. Hiller are interested.

New York, Amsterdam. The Saratoga Textile Company, with a capital of $1,000,000, has just been incorporated here. The directors and the shares of stock controlled by them are as follows: William W. Boyd, 5 shares; William P. Tarrant, 9,990 shares and Hiram C. Todd, 5 shares.

New York, Fonda. The Empire Fabric Co. has been incorporated with capital stock of $7,500 to operate the Nottongham Fabric Co.'s plant, making silk, cotton and mercerized goods. Joseph Bachuer is president of the company and August Lkein (Gloversville) treasurer. The mill is equipped with 11 looms and 120 silk spindles.

New York, Fulton. It is reported that the American Woolen Company has acquired property at this place and that they propose erecting an additional mill.

New York, Lyons. It is reported that the Gloversville (N. Y.) Silk Mills, which have been operating a branch mill at this place, will probably remove their entire plant to this place.

New York, N. Y. The Munsdorff Silk Company has been incorporated with capital stock of $35,000 by A. J. Munsdorff, S. T. Bondhus and Charles Kettelle.

*New York, Seneca Falls. It is reported that another project is under way for starting the Seneca Woolen Mills. It is proposed to organize the Seneca Falls Woolen Co. and issue bonds to the amount of $100,000 to pay off the indebtedness. T. W. Pollard is interested.

New York, Victory Mills. The Saratoga Victory Mfg. Co., with a factory in Schuylersville known as the Horican Mill, as well as their main factory in this town, have posted a notice in both factories to the effect that the pay of their 600 employes would be increased 6 1/4 per cent. This

company manufactures cotton piece goods, operating 25,904 ring, 20,768 mule spindles and 1,076 looms.

North Carolina, Bessemer City. The Crescent Mills have been incorporated with capital stock of $150,000 with C. A. Davis, president; E. D. Bullard, vice president and C. E. Whitney, secretary and treasurer.

North Carolina, Cherryville. The Melville Company has been incorporated with capital stock of $125,000 for purpose of manufacturing cotton goods. M. L. Rudisell and J. S. P. Carpenter are among those interested.

North Carolina, Lattimore. The Pink Manufacturing Co. has been reported incorporated with capital stock of $50,000. Among those mentioned as interested are J. L. Stroup and W. T. Calton.

North Carolina, Mt. Airy. A proposition in under way for establishing a cotton mill at this place. It is proposed to utilize the old Hadley Smith tobacco factory and instal 25,000 spindles.

*North Carolina, Roaring River. The property of the Damask Manufacturing Co. has been sold again, to the Greensboro National Bank and The Carolina Supply Co., for $8,740, an advance of 10 per cent. over price paid by N. B. Mills, of Statesville.

*Oklahoma, Guthrie. Plans have been prepared for the Pioneer Cotton Mill and it is stated that work will start at once on erection of the new buildings.

*Ontario, Guelph. We have been advised by R. J. Strauss, of Brantford, that although he has had some correspondence relative to the proposed hosiery mill at this place, that nothing definite has yet been decided upon.

Pennsylvania, Ambler. William Steele & Sons Co., builders of Philadelphia, are estimating on plans for a two-story stone and basement repair shop 72 by 132 feet for the Keasby & Mattison Co., manufacturers of fireproof fabrics and asbestos materials.

Pennsylvania, Bally. The Orino Silk Mills, Geo. W. Melcher, proprietor, are now running in full, making silk ribbons. James Stein is superintendent of the plant, equipped with 8 looms and operated by steam. Product is sold direct.

Pennsylvania, Newtown. The American Transforming Company has been started by Bruno Sonne (Lodes, Russia) and Frederick Walker (Fox Chase), for transforming plush. They will start with four machines.

Pennsylvania, Philadelphia. Incorporation papers are to be applied for by Messrs. William A. Bruch & Co., manufacturers of carpet yarns on 3 sets, 468 mule spindles. The incorporators are W. A. Bruch and James Ashton, Jr.

Personals.

Chas. Bromley has accepted a position as overseer of carding for the Athens Knitting Co., Athens, N. Y. He was formerly of Norwich, Conn.

J. A. Thomas of Burrillville, R. I., is the new overseer of weaving for the Peace Dale Mfg. Co. of Peace Dale, R. I., succeeding Geo. A. Copeland, resigned.

Joseph E. Pike, overseer of weaving for the Airlie Mills of Hanover, Conn., has resigned.

W. E. Buice, overseer of spinning for the Globe Mills of Gaffney, S. C., has gone to Inman, where he will take a similar position with the Inman Mills.

Charles M. Davis, formerly with the French River Textile Co., Mechanicsville, Conn., has taken a position as designer for the Tillotson Mfg. Co. of Pittsfield, Mass.

Mr. John P. Sherrin, for some time overseer of spinning for the Pontoosuc Woolen Co. of Pittsfield, Mass., has resigned his position on account of ill health. He is succeeded by Joseph Ringie.

W. H. Rice has taken the position of overseer of spooling and dressing for the Lees Mfg. Co. of Westport, Conn.

John Jamieson, overseer of mule spinning for the J. W. Dimick Co., Esopus, N. Y., has resigned his position and will be succeeded by Joseph Stocks of Seelyville, Pa.

Fred Sutcliffe of North Andover, Mass., has taken the position as overseer of dyeing for the Maine Woolen Co. of Old Town, Me.

Charles H. Hartley, overseer of combing and drawing at the Nashua Valley Mills, of Clinton, Mass., has resigned and been succeeded by Harris Robinson, of Skowhegan, Me.

Robert E. Horne, overseer of weaving for A. Roberts & Co., has resigned his position.

Charles Gledhill, overseer of finishing for the Oakland Mills Co., Sykesville, Md., has accepted a similar position with the Westmoreland Dye Works of Philadelphia, Pa.

Joseph St. John, who recently resigned as overseer of spinning for the Forestdale Mfg. Co., Forestdale, R. I., was presented with a fountain pen by the employes in the spinning room. He has gone to Holyoke, Mass.

Joseph Povin has resigned his position as foreman of the spool room at the Forestdale Mfg. Co., Forestdale, R. I., and has gone to New Bedford, Mass.

John King, formerly with the Maine Woolen Co., has resigned his position and taken a position as overseer of finishing with the Old Town Woolen Co. of Old Town, Me. Frank L. Morginson, who has been overseer of finishing for the latter company, has succeeded Mr. King at the Maine Woolen Co.

Joseph Shaunessy, formerly overseer of finishing at the Standish Worsted Mills of Plymouth, Mass., has resigned his position and accepted a similar position with the Burlington Mills at Winooski, Vermont.

B. M. Parker, instructor in carding and spinning at the Clemson Agricultural College, Clemson College, S. C., has resigned his position to accept one as assistant professor of the textile department with the North Carolina College of Agricultural and Mechanical Arts of Raleigh, N. C.

Joseph Hammill has resigned the superintendency of the Ossipee Cotton Mills at Elon College, N. C., on account of the ill health of his wife. They will return to their former home in Gloucester, N. J. John E. Shaw of Rockingham, N. C., succeeds Mr. Hammill.

Thomas Nelson, who has been assistant professor at the A. & M. C. College at Raleigh, N. C., has been elected professor of the textile department to succeed Henry M. Wilson, who resigned some time ago to accept a position with the Poe Mfg. Co. at Greenville, S. C.

John Convery, for the past five years overseer of th finish room of the Boston Duck Co,. of Bondsville, Mass., has resigned to return to Valleyfield, Quebec, to take the superintendency of the dyeing, bleaching and finishing departments of the Montreal Cotton Co.

William Heathcote has been appointed superintendent of the Chicopee Mfg. Co., Chicopee, Mass., under Agent M. A. Rollinson.

James H. Robinson, overseer of finishing at the Warren Cotton Mills, West Warren, Mass., severed his connection with that mill June 9th, and has been succeeded by Charles F. Gardiner of Lowell.

Walter Oldham, overseer of finishing at the Camden Woolen Co., Camden, Me., severed his connection with that firm on June 9th.

Jerry Daley has resigned his position as overseer of carding for the G. T. Murdock & Son Co., of New Boston, Conn., and is succeeded by Nicholas Hanley.

John Beaumont has resigned his position as superintendent of the mills of the Henry Klous Co. to return to the Stoughton Mills, Stoughton, Mass.

T. D. Douglas has taken the position of overseer of weaving for the Assawaga Company of Killingly, Conn.

The overseers of the Beckman Co., Northern Ohio Blanket Mills, Cleveland, Ohio, are Henry Balbian, superintendent; Frank Mercer, overseer of carding; Enoch Buck, second in carding; J. A. Provo, overseer of spinning; J. Vovotny, overseer of picking; T. Cadzow, overseer of weaving; W. Kohler, overseer in blanket room; J. Fisher, overseer of finishing.

Frank Morginson, formerly of Old Town, Me., has taken charge of the finishing department of the Oakland Mfg. Co., of Sykesville, Md.

E. H. Pero, overseer of finishing for the Western Woolen Co., of Topeka, Kansas, has resigned his position to return to his position with Meek Bros., of Bonaparte, Iowa.

James A. Fagan has severed his connection with the Morrison Woolen Co., of Dexter, to return to the employ of the Old Town Woolen Co., of Old Town, Maine.

P. J. Carey, formerly with the Assawaga Company of Dayville, Conn., has taken the position as overseer of finishing for the Black River Woolen Co., of Ludlow, Vt.

Walter J. Holden, formerly of the Hargraves Mills, of Fall River, Mass., has taken the position as superintendent of the Boott Cotton Mills, of Lowell, Mass. He is succeeded in Fall River by Fred Heys.

Weldon F. Twitty, who has been bookkeeper at the office of the Spartan Mills, Spartansburg, S. C., has resigned to accept the general managership of the Darlington Mills, of Darlington, S. C.

John Riley has resigned his position as overseer of weaving in the Mill No. 1 of the Peabody Mfg. Co., of Newburyport, Mass., to go to Fall River.

E. J. Flanagan, formerly of the Tremont and Suffolk Mills, of Lowell, Mass., is now superintendent of the Burlington Cotton Mills of Burlington, Vt.

B. J. Craggy, formerly of Lowell, Mass., has taken the superintendency of the mechanical department of the Nashua Mfg. Co., of Nashua, N. H.

H. M. Goddard, overseer of carding in the Franklin Mills, Franklin Falls, N. H., has resigned his position on account of ill health and is succeeded by Chas. A. Cobbett, formerly with the Aetna Mills of Watertown, Mass.

David Welsh, overseer of finishing for the Geo. H. Gilbert Co., of Ware, Mass., has resigned his position and is succeeded by Fred H. Linker of Springfield, Mass.

George Dickey of North Adams, Mass., has accepted a position as overseer of weaving for the Williamstown Mfg. Co., of Williamstown, Mass.

Fred Manchester of Lowell, Mass., has taken the position as overseer of weaving for the Methuen Cotton Mills of Methuen, Mass.

John McConkey has resigned his position as overseer of spinning for the North Adams Mfg. Co., of North Adams, Mass., and has returned to Pittsfield, Mass.

James H. Parker, formerly overseer of carding and spinning in the No. 1 mill of the Warren Cotton Mills, of West Warren, Mass., now has a similar position with the Uncasville Mfg. Co., of Versailles, Conn.

Robert Stevens, overseer in the skein department of the Wright Braid Mill, of Lawrence, Mass., has resigned to accept a position with the Wood Worsted Co.

Roy Fritz, of Philadelphia, has accepted a position as overseer of drawing in for the Grove Worsted Mills, of Trenton, N. J.

William H. Dyer has been engaged as overseer of spinning in the one and two departments of the Boott Cotton Mills, at Lowell, Mass.

Mr. Thomas E. Ashdale has taken a position with the Friedburger-Aaron Mfg. Co., of Philadelphia, Pa., as overseer of mercerizing, dyeing and bleaching.

S. C. Feeley has accepted a position with the Ray Mills, of Franklin, Mass., as overseer of wet finishing.

Joseph Hamilton has taken the position as overseer of spinning for the Assawaga Company, of Dayville, Conn.

Samuel F. Came has accepted a position as overseer of spinning for the Clinton Mfg. Co., Clinton, Mich. He was formerly of the Assawaga Company, of Dayville, Conn.

James Tattersall has accepted a position as assistant designer for the Lancaster Mills, of Clinton, Mass. He was formerly at Fiskdale, Mass., and more recently at West Warren.

William Etchells, overseer of weaving for the Williamstown Mfg. Co., of Williamstown, Mass., resigned his position on account of ill-health.

Patrick O'Brien has resigned his position as overseer of the twisting department at the Taconic Mills of Pittsfield, Mass.

H. I. Russell of Boston has taken the position as assistant superintendent of manufacturing at the Amoskeag Mills of Manchester, N. H.

Mr. B. B. Reid, who has for several months been superintendent of Crescent Manufacturing Company of Spartanburg, S. C., has resigned.

W. P. Hurt, for the past two years overseer of carding for the Louise Mills of Charlotte, N. C., has resigned to accept a similar position with the Florence Mills of Forest City, N. C.

Alfred Bradley has resigned his position with the Gosnold Mills of New Bedford, Mass., to take a position as overseer of weaving with the Page Mills.

S. J. Hall, formerly with the Racine Woolen Mills of Racine, Wis., has resigned to accept a position as overseer of weaving with the La Porte Blanket Mills of La Porte, Ind.

M. H. Shea, overseer of weaving for the past twelve years for the Sayles & Jenks Woolen Mills, Warren, Mass., resigned his position Saturday, June 23d. Weavers employed under Mr. Shea presented him with a handsome gold watch, chain and charm. Mr. Shea was entirely taken by surprise and thanked those that presented the gift in a few chosen words. Mr. Shea will take a short rest before engaging in another position.

Guy G. Paris has taken a position with the Monadnock Mills of Claremont, N. H.

Ernest Rhodes has accepted a position as assistant superintendent and overseer of weaving for the Indian Spring Mills of Madison, Me.

Chas. S. Buck has taken a position with the Tingue Mfg. Co. of Seymour, Conn., as overseer of drawing, spinning and twisting.

John E. Martin, formerly of Leominster, Mass., has taken charge of weaving for the Merrimack Woolen Co. of Lowell, Mass.

Albert Sweet, for a number of years overseer of weaving at the Royal Mills at Riverpoint, R. I., has resigned on account of ill health, and will be succeeded by Cornelius Donohue, at present overseer of weaving for the Valley Queen Mills.

Mr. and Mrs. H. Schadewald and daughter of Philadelphia sailed for Europe on the Hamburg-American steamer Batavia Saturday, June 9th, to be gone four months. The business will be carried on by his three sons, this being Mr. Schadewald's first trip to the old country which he left when eight years of age.

Deaths.

Edwin Gledhill, general manager of the Marston Worsted Co. of Skowhegan, Me., was drowned May 31, by the overturning of a canoe. Mr. Gledhill was 36 years of age, and leaves, beside his wife, his mother and sister and two brothers.

John Thomas Lodge died at his residence, 19 Fairmount Ave., Newton, Mass., on the morning of June 5th. He was born on Copp's Hill, Boston, Feb. 8, 1857, was educated in the Boston public schools, and at the time of his death was head of the Boston house of John T. Lodge & Co., having been in business in Boston for 33 years.

Andrew Simpson died at his home, Green Lane and Baker Street, Manayunk, Pa., on June 4th, in his 68th year. Mr. Simpson was senior member of the manufacturing firm of Simpson Bros., proprietors of the Burnhill Woolen Mfg. plant in the Ripka Mills, Manayunk, Pa. He was born in Scotland and came to this country in 1873, locating in New Castle, Del. Later he removed to Frankford and in 1890 to Manayunk.

Jeremiah Richards, a member of the silk commission house of Spielman & Co., New York, died at his summer residence at Stamford, Conn., June 8, after an illness of about one year. Mr. Richards was a native of Boston but made his home in New York for many years. He leaves a wife, a daughter and a son.

Luther Laraway, a prominent mill man, is dead in Olneyville, R. I. He had been engaged in woolen manufacture in Moosup, Conn., in Rhode Island, and at Cherry Valley, near Worcester. He was a native of Leeds, N. Y.

William Grosvenor, treasurer of the Grosvenordale Company of North Grosvenordale, Conn., died at his home in Providence, R. I., on June 20. He was stricken with apoplexy at his office and never recovered consciousness.

Henry Gaunt of the Tremont Worsted Co. of Methuen, Mass., died at the General Hospital, Lawrence, Mass., on June 13, as the result of an operation. Mr. Gaunt was about 55 years of age and came from Worcester. The business will be continued by his sons.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Correction.

In our June issue the price of "Economical and Successful Management of Cotton Mills," by Henry D. Martin, was given at $1.00. This is incorrect. The price is $1.50.

Cotton Manufacturing—Part 2; by E. A. Posselt; Philadelphia, Pa. Price $3.00.

The second part of this exhaustive treatise on Cotton Manufacturing has been published. The subjects covered by this volume are: Combing, Drawing and Fly-frames, with a sub chapter on Roller Covering. Part 2 takes up the subject where it was left by Part 1. The comprehensive plan of this work on cotton manufacturing has enabled the author to handle each process in elaborate detail; all the points requiring illustration are most carefully worked out by special drawings and made clear by illustrations of machines and parts of machines; the calculations for each process are systematically arranged, and the different machines employed in the various processes are explained. A descriptive circular giving in detail the contents of the book may be had upon application.

The Analysis of Fabrics (L'Analyse des Etoffes); by Achille Lecointre, 230 pages, 7 1/2 by 11; H. J. Lecointre, Lille, France. Price $6.00.

This elaborate work is devoted exclusively to the analysis of fabrics. The author is a textile designer and has placed the results of his studies and observations before the reader in a very systematic manner. The introduction contains an account of the different kinds of fabrics such as woolens, knit goods, laces, embroideries, passementeries, etc. He then takes up the analysis, arranging the subjects under the following heads: Distinguishing Warp and Filling; Back and Face of the Goods; Determining the Weave; Jacquard Fabrics; Velvets; Lenos; Warp and Filling Patterns; The Sett; Size of the Yarn; Take-Up; Weight; Analysis of Leather Goods; Ribbons; Belting Fabrics; Beaded Goods; Feather Decorations; Horsehair Goods; Fabrics of Spun Glass; Carpets; Felts and Felted Fabrics; Knit Fabrics; Metallic Fabrics; Straw Fabrics; Testing Cloths; Testing Yarn; Tests for Fastness of Colors; Use of the Microscope. The text of this work is in French.

Universal Technical (Lexikon der gesamten Technik); Parts 11, 12, 13, 14, 15; by Otto Lueger; Deutsche Verlags-Anstalt, Stuttgart, Germany. Price of each part, $2.00.

The five parts of this lexicon just received are the latest to come from the press and are fully equal to the standard of those already issued. The work will be completed in forty parts.

Evolution of Weights and Measures and the Metric System; by William Hallock, Ph.D., Professor of Physics in Columbia College, and Herbert T. Wade, Editor for Physics and Applied Science, the New International Enclycopedia; 294 pages, 5 1/2 by 9; The MacMillan Company, New York; price $2.25.

The expectant reader of this book is told in the preface that it is "the intention of the authors to avoid controversy and include a mere statement of facts rather than to repeat or even add to the arguments." They confess they "are supporters of the metric propaganda and ask indulgence for any departure from the plan determined on." No one ought to grant them such indulgence; we hope no one will. The main reason for this constant agitation to change our established standards and throw the country into confusion is that the movement has the support of the college professors, so-called scientific men, school teachers, and educators generally; men who are not engaged in manufacturing or trade, but who bring to the support of their opinions the great weight of authority that accompanies college education and culture. There are thousands, possibly millions, of men and women who favor or tolerate the proposition to change our established standards, for no other reason than that educators and scientists generally favor it. The statements in a book on weights and measures by two college men, like Prof. Hallock and Mr. Wade, will be widely accepted without question by those who have neither the time nor the inclination to investigate the question for themselves. Even, therefore, without the assurance in the preface that they intend to state only the facts, such authors should be held to strict account not only for any departure from the facts, but for any suppression or avoidance of the facts.

In the chapter entitled, Weights and Measures in the United States, the authors attempt to belittle John Quincy Adams' report, and by citing isolated passages create a false impression regarding Adams' position. They quote that part of the following extract that we have placed in brackets and omit the succeeding and qualifying portion.

"[It is in design the greatest invention of human ingenuity since that of printing.] But like that and every other useful and complicated invention, it could not be struck out perfect at a heat. Time and experience have already dictated many improvements in its mechanism; and others may, and undoubtedly will, be found necessary for it hereafter."

It is impossible to reconcile such garbling of Adams' report with any other desire than to deceive the reader. Referring to the adoption of the metric system in other countries, the authors state that "in the same year (1905) New Zealand adopted the metric system as its legal system of weights and measures." This is not the case and an official denial of the report was made some months ago. By including the statement in their joint production, Messrs. Hallock and Wade show how little reliance can be placed on their "statement of facts."

Another misleading passage is to the effect that the Brighton Railway in England "employs the

kilogram for all its European business," and that "it is the opinion of the officials of this road that the keeping of all accounts would be simplified by using metric weights and measures." By referring to the testimony before the committee of the House of Lords on which this statement is based, we find the witness expressly limited his statement to weights, and added that the change would not be of much use unless the currency was changed to a decimal basis, told how much trouble it would cause to recast established freight rates now based on the mile and pound to the kilogram and kilometer, that everyone would have to change his previous knowledge, that the Continental business of his road was only one or two per cent. of the total, and that by the agreement with the French roads through freight is taxed by the metric ton and French currency at fixed rates pro rata for distances on each side of the channel.

In another part of their book the authors repeat approvingly the absurd claim that the metric system would save a year in every child's school course, but omit to state that the child spends less than seven weeks in studies in which weights and measures are a factor.

One of the most objectional parts of the book is where the authors convey the idea that United States standards of weights and measures can be and are fixed by executive order. As is well known, the Constitution gives the authority to fix standards to Congress alone, and any attempt of the executive authority to exercise this power is unconstitutional, null and void. The object in trying to create the contrary opinion is obvious. It is to secure popular sanction for the persistent and unlawful attempts by the present employes of the National Bureau of Standards to place our standards on a metric basis. Perilous indeed would be the position of our established standards if power to fix them were lodged in the hands of men who publicly proclaim that the English system "is not worth a damn."

These typical examples of Messrs. Hallock and Wade's "mere statement of facts" illustrate the biased character of their book. Their utter misconception of the value of established standards in commerce and manufacturing is indicated by their assurance of how easy it would be to change and their omission of all reference to textile manufacturing, which, rated by the number employed, is the leading industry of the United States, and which, it is estimated, supports directly or indirectly one-quarter of the inhabitants of Great Britain.

The book is blurred from start to finish by a confusion of ideas regarding decimal and metric weights and measures, and the authors indicate the narrowness of their view by using "metric" and "universal" as interchangeable terms.

In discussing the measurement of standards by by wave lengths of light they ignore the fact that this method is as well adapted for the measurement of one standard as another. They convey the idea that light waves and metric standards have some peculiar relation. Carrying along this idea they close the book with the following vision of what would happen if "some cataclysm should suddenly destroy" our standards:

"The meter would be gone, the quadrant of the earth no longer the same, and apparently our last tie broken. Not all the ties, for one, a little one, remains, like hope in the bottom of Pandora's box. A wave of light so small that a thousand would hardly reach across the eye of a needle, this is the key to the restoration of our system of most complicated and complete units. So long as the earth has a material existence, so long as there is light and heat, so long is man in the position to rebuild his system of units and standards. The work of Michelson in comparing the international meter with the wave-lengths of light has put our system upon a foundation that is as permanent as the universe. If man were transported to the uttermost confines of the universe, he would still have the little waves of light, and they would be just the same as here. If some day we are able to communicate with the dwellers on some other planet, it will be a simple thing to communicate with them our standard of length and time and mass, and with the little waves of light to convey our message we may ultimately impart our exact knowledge to them, and receive theirs in return. The laws of light motion, of gravitation, of electricity, are undoubtedly identical for the whole universe, and given the first communication of another world we would be able to establish a truly universal system of units and standards. By this means inter-planetary communication would be placed upon a quantitative basis, the omnipresent, everlasting, but ultra-microscopic wave of light would be the universal, unchanging standard."

The visionary and deceptive character of this book would not deserve exposure were it not for the fact already mentioned that such works are widely accepted as true because of the prestige carried by college degrees and professorships.

Directory for the French and Foreign Silk and Silk Piece Goods Trade and Silk Industry (Agenda des Soies et Soieries); 825 pages; A. Rey & Cie, Lyons, France. Price $2.50.

The 1906 edition of this well-known directory has recently been received. The list of silk manufacturers and dealers in France has been compiled with great care and is unusually complete; it is classified according to districts. In addition to the French silk mills and dealers the directory contains a list of the principal silk manufacturers and dealers in foreign countries. The index enables the reader to refer quickly to any desired firm in the body of the book. The text is in French.

Letters of a Mill Manager Concerning Factory Organization (Briefe eines Betriebsleiters ueber Organisation technischer Betriebe); by Georg L. Erlacher, director of the Ateliers Electro-Techniques, in Bois-Colombes, France; 62 pages 6 by 8 1/2. Price $1.00.

The author of this book expresses his ideas with all the conciseness and emphasis of the thoroughly practical man. The material is in the form of eight letters on the following subjects: Technical Organization and Personnel; Working to the Drawings; Numbering Drawings; Cost Accounts; Organizing the Operatives; Expense Account; Piece Work, Premium System; Profit Sharing. The text is in German.

Double Face Reform Weaves (Beidrechte und andere Austausch-oder Reformgewebe); by Nicholas Reiser; 3d edition, 212 pages, 6 by 9; Arthur Felix, Leipzig. Price $2.50.

This work treats exclusively of weaves in which every warp thread forms alternately the back and face of the weave, thus dispensing with separate sets of threads for back and face. The filling may be woven with or without backing. The first edition of this work was published in 1894 and we believe the author claims the credit for having originated the reform weaves. Although this claim may be subject to some modification, there is no question that he has done much to develop these weaves in the production of commercial fabrics. The present edition includes all that appeared in the two former editions and also considerable new material relating to reform weaves for double face goods. In addition to the text and weave drafts there are 42 cloth samples illustrating the various reform weaves. Full details regarding the structure of each fabric are also given. The text is in German and the book will well repay study by every designer and weaver.

Plush Fabrics (Die Florgewebe); by Wilhelm Bosheck; A. Hartleben, Wien and Leipzig. Price $2.00.

This work deals with the weave construction of the various kinds of pile fabrics. It is divided into three parts, of which the first is devoted to carpets and the construction of the looms. We learn of the construction of Oriental rugs by hand-work, the jacquard carpets and have a glimpse of the process of yarn dyeing for the warp of tapestry and velvet carpets. Various processes and machines for the production of the genuine and imitation carpet fabrics are also described. Part 2 is devoted to moquettes, mohair, plush, table covers, linen and cotton plush, double pile fabrics, etc. Part 3 describes the great variety of plush fabrics used for clothing, including shoe plush, silk velvet, filling velvet, as well as the imitations of the various furs, sealskin, astrakhan, beaver, bear, lamb, etc. The production of Turkish towels is given a separate chapter. The text is in German.

Influence of Finishing on the Physical Structure of a Half-Wool Fabric (Einfluss der Appretur auf die physikalischen Eigenschaften eines halbwollenen Gewebes); by Dr. Desiderius Schatz; Hallberg & Buchting, Leipzig, Germany. Price 50 cents.

This is a study made by Dr. Schatz to secure the degree of Diplom-Ingenieur, and deals with the influence of the finishing process on the structure of half-wool fabrics. It begins with a general chapter on testing for strength of cloth and testing yarn. The author then takes up the tests of goods in different stages of finishing, beginning with the cloth as it comes from the loom and then dealing in succession with scoured goods, fulled goods, gigged cloth, steamed and sheared cloth, colored goods and finished fabrics. The subject is treated in great detail. While the pamphlet is of but slight practical use, it shows the thoroughness with which Dr. Schatz has studied the question. The text is in German.

Dyeing and Bleaching (Faerben und Bleichen), Part II; by Dr. J. Herzfeld and Dr. Felix Schneider; 437 pages, 7 by 10; M. Krayn, Berlin, Germany. Price, $4.00.

The second part of this work treats of washing and bleaching. It begins with a general account of the textile fibres. This is followed by chapters on the following subjects: Bleaching of cotton; bleaching linen, hemp, jute; bleaching ramie; washing and bleaching wool; boiling off and bleaching silk; mercerizing and silk finishing machines; centrifugal machines. The work is profusely illustrated and the different subjects are treated in a careful and systematic manner. The text is in German.

The German-American Commercial Treaty and the Phantom of American Industrial Competition (Der deutsch-amerikanische Handelsvertrag und das Phantom der amerikanischen Industriekonkurrenz); by Dr. Heinrich Dietzel, Professor at the University of Bonn; 2d edition; 51 pages, 6 by 9; Leonhard Simion, Nf., Berlin, Germany.

This is a careful study of the commercial relations between Germany and the United States. In the second part the author gives his attention more particularly to what is known in Europe as the "American peril." Dr. Dietzel is convinced that this is largely a phantom and that the exports of the United States to Germany are but the result of Germany's prosperity and as such should be a source of encouragement to Germans instead of awakening fears of American domination. The text is in German.

Electric Bleaching (Hypochlorite und elektrische Bleiche); by Dr. Emil Abel; 110 pages, 6 1/2 by 10; Wilhelm Knapp, Halle, Germany. Price $1.75.

This is a theory of the electric production of bleaching liquor. It is illustrated with 20 plates and tables. It is written by one of the leading authorities on the subject, a chemist employed by the well-known firm of Siemens & Halske, at Vienna. The text is in German.

Yarn Dyeing with Azo Developer (Der Garnfarberei mit den Azo-Entwicklern); by Dr. Franz Erban; 485 pages, 6 1/2 by 9; Julius Springer, Berlin, Germany. Price $4.50.

In this volume of 485 pages the author has treated the dyeing of yarn in an unusually thorough and systematic manner. Beginning with a brief review of the progress made in dyeing with colors developed on the fibres he treats the subject under the following heads: Preparation of the Yarn for Dyeing; Machines and Processes; Preparing the Yarn; Drying the Prepared Yarn; Developing Colors; Paranitraniline Baths; Preparation of and Use of Diazo Solutions; Drying the Yarn after Dyeing; Estimating the Cost of Dyes; Various Shades on Yarn with Azo Dyes; Preparation of the Azo Developer for Loose Wool, Cops and Yarn; Impregnating Dry and Wet Goods; Development of Dry and Wet Goods. The text is in German.

The Overseer of Weaving (Der Webmeister fuer mechanische Weberei); by Franz Kraus; 63 pages 10 by 6 1/2; Franz Deuticke, Vienna and Leipzig. Price $1.00.

The mechanical construction of the different makes of looms is described in this book, which is freely illustrated. It treats mainly of the looms used in the mills of Continental Europe and the author has confined himself to a statement of the construction of the machines, avoiding practically all reference to their operation, although there is considerable space devoted to the building of warp and filling chains for different patterns. The text is in German.

Artificial Silk (Seta Artificiale); by G. B. Baccioni; 231 pages, 4 by 6; Ulrico Hoepli, Milan, Italy. Price $1.50.

This volume forms one of the well-known Hoepli manuals and as its name indicates is devoted to the artificial silk industry. It begins with a history of the industry and then follows a technical description of the different processes in the manufacture of artificial silk. The book is illustrated with a number of excellent plates of microscopical views of the filaments, and is very attractively bound in gray artificial silk. The text is in Italian.

The Dyeing Industry (La Industrie Tinctoriale); by Francis J. G. Beltzer; 1017 pages, 6 1/2 by 10; H. Dunod & E. Pinat, Paris, France. Price $8.00.

This work has been written in order to bring under one cover in as compact and systematic form as possible the principal mechanical and chemical methods employed in the dyeing of textiles. Owing to the close connection between chemistry and dyeing the author has devoted considerable space to the chemistry of coloring matters. He then takes up the different processes of dyeing. The theory of dyeing is discussed and the various processes are treated in the order in which they follow each other in the mill. The latest machinery and processes are described and illustrated. Following is an abstract of the table of contents: General Survey of the Construction, Installation and Management of Dyeworks; Treatment of Textiles; Animal and Vegetable Fibres; Dyeing Cotton and Other Vegetable Fibres; Substantive Dyestuffs; Tests for Coloring Matters; Bleaching for Dyeing; Linen, Hemp, Jute, Ramie, Paper, Straw, Wood, Flowers, Wool, Silk, Hair, Feathers, Leather; Various Animal Materials; Artificial Textile Materials. The text of this elaborate work is in French.

Tabular Sketch of the Artificial Dyestuffs and their Use in Dyeing and Printing (Tabellarische Uebersicht ueber die kunstlichen organischen Farbstoffe); by Dr. Adolf Lehne; Julius Springer, Berlin, Germany. Price $2.00.

We have received the third and last instalment of this valuable work, which gives in systematic arrangement a great amount of information regarding artificial dyestuffs now in use. Particulars regarding the chemical properties, fastness, and method of application of each dye, with tests to determine the same on the fibre are given opposite the sample showing the color produced.

Handbook on the Manufacture of Pigments (Handbuch der Farben-Fabrikation); by George Zerr and Dr. R. Rubencamp; Steinkopff & Springer, Dresden, Germany.

We have received parts 11, 12, 13, 14 and 15 of this book, which is to form when completed a thoroughly practical and scientific treatise on the manufacture of pigments. The text is in German.

Bleaching and Finishing Table Linen (Le Blanchissage et l'Appret du Linge); by Louis Verefel; 180 pages, 4 1/2 by 7; Bureaux de la Revue, Paris, France. Price $1.25.

This book is intended as a practical handbook for the bleaching and finishing of linen goods in laundries. It gives the amount of the different chemicals employed and contains statements of cost taken from the actual records of some establishments. There is a technical description of various processes, all being freely illustrated with cuts of the different machines employed. Following is an abstract of the table of contents: Articles to be Bleached; Theory of Bleaching; Chemicals Used in Bleaching; Washing, Fulling, Rinsing, Drying; Washing Machines and Extractors; Receiving and Marking Articles; Antiseptic Bleaching; Finishing, Sizing, Boiling. The text is in French.

Chemistry of Organic Dyestuff (Chemie der organischen Farbstoffe); by Dr. R. Nietzki, Professor of the University of Basle; 355 pages, 5 1/2 by 8 1/2; Julius Springer, Berlin, Germany. Price $3.00.

This book is an outgrowth of a paper prepared for A. Ladenburg's book on chemistry, published in Germany some years ago. The desirability of a more detailed statement of the subject led the author to collect additional material, which he has placed in convenient form for reference and of which the fifth edition has just been issued. Students of the chemistry of dyeing will find it of great value. The text is in German.

Mechanical Technology of Textile Fibres (Mechanische Technologie der Faserstoffe); by Alfred Haussner, Professor in the German Technical High School in Brunn; 243 pages, 10 by 7; Franz Deuticke, Leipzig and Vienna. Price $2.50.

This is the first part of a work that is intended to treat of the different mechanical processes of spinning, weaving and paper manufacture. The first instalment just received begins with a description of the old methods of spinning by hand, followed by an interesting account of the manufacture of rope and twine from straw. The processes of drawing and spinning are illustrated and in this way the reader is brought to a consideration of the improved methods of spinning by power, the discovery of which marks the beginning of such a successful development in the textile industry during the latter part of the eighteenth century. The present methods of drawing and spinning the various textile fibres are then discussed. Part two of the first volume relates specially to the spinning of cotton and is divided into the following sections: The Cotton Fibre; Mixing, Opening, Picking, Carding, Drawing and Spinning. The manufacture of paper will be

treated in the succeeding volume. The text is in German.

Caoutchouc, Gutta-Percha and Artificial Gum (Caoutchouc, Gutta-Percha, Gomme Factice); by Georges Petit; 2 vols., 778 pages, 3 3/4 by 6; L. Mulo, Paris, France. Price $1.50.

This handbook begins with a history of the rubber industry after which the author takes up the different branches of the industry and process of manufacturing, treating them in detail. There are numerous recipes and the reading matter is illustrated with a large number of drawings. The text is in French.

Business Literature.

Engines; American Blower Co., Detroit, Mich.

A catalogue describing the engines for small direct connected generator sets, including the vertical high speed automatic types A and E, and covering a range of capacity from 4 to 40 k. w. or from 75 to 750 lamps of 55 watts, 16 candle power. The weight of any size will come within one pound for every 3½ watts for most of the standard makes of dynamos. The catalogue is illustrated and includes much information of value to power users.

A B C Engines; American Blower Co., Detroit, Mich.

A catalogue illustrating and describing the various types of the A B C engines built by this concern.

Disc Ventilating Fans; American Blower Co., Detroit, Mich.

This catalogue gives a description of the American Blower Co.'s disc ventilating fans and is freely illustrated.

Catalogue of the North Carolina College of Agriculture and Mechanic Arts, West Raleigh, N. C.

This catalogue gives the usual information regarding organization and the course of the college, in connection with which an excellent textile department is maintained. The textile instruction is confined chiefly to the cotton industry. In addition to the regular four and two-year courses, special ten weeks' courses are given to accommodate superintendents and overseers and other mill operatives who cannot spare the time for the full course. The members of the faculty of the textile department are: Henry M. Wilson, A. B., professor of textile industry; Thomas Nelson, instructor in weaving and designing; John H. Shuford, B. S., instructor in dyeing; Herbert N. Steed, assistant in textile industry.

Unions for Steam Pipes; Joseph Dixon Crucible Co., Jersey City, N. J.

This is an illustrated description of the various kinds of unions for steam pipes and contains many valuable suggestions. It is compiled by W. H. Wakeman, an expert steam engineer and the author of several well-known books on steam engineering. The pamphlet is reprinted from Dixon's Graphite and a copy will be sent on application to the publishers.

Bulletin of the Lowell Textile School, Lowell, Mass.

We have received a copy of this Bulletin for 1906-1907. It is brought to date and gives the usual information regarding the organization and work of this well-known institution.

Generator for Roanoke Rapid Power Co.

The Roanoke Rapid Power Co., Roanoke Rapids, N. C., have ordered from the Crocker-Wheeler Company of Ampere, N. J., one 750 k. w. 2300 volt, 200 r. p. m. alternating current generator to be installed at the company's power plant at Roanoke Rapids.

The Bigelow Carpet Company, Lowell, Mass., have adopted the American Moistening Company's system of humidification.

The Arabol Manufacturing Co.

Textile manufacturers who are having trouble with sizing and finishing materials, or have desirable improvement in these respects in view are invited to consult with the Arabol Manufacturing Company, 100 William St., New York. Scientific specialization, long and extended experience, modern facilities in factory and laboratory under highly trained and skilled management, enable them to meet any conditions. They are continually adding to the staples that have made them so popular with the trade.

Gambia Eliminated.

The Acting Collector of Customs at Bathurst in his observations on the trade statistics of the Gambia for 1905 says it is recognized that the growing of cotton in the Gambia territories on a scale suitable for export cannot pay at the present prices, and it is clear that the industry is at an end. The people will have none of it, preferring to devote their energies to the cultivation of ground nuts, which gives them a much better return for their labor. Of course a certain amount of cotton will always be grown in the colony, but only for local comsumption. For this there is a ready sale at about 2½d. per pound in the seed, which represents a price of about 8d. per pound for lint cotton. —Cotton Factory Times.

The Crocker-Wheeler Company of Ampere, N. J., has received an order from the World's Star Knitting Co., Bay City, Mich., for one 75 k. w. a. c. generator and one 4 1/2 h. p. 125-volt motor. From the Joseph McWilliams Co., Memphis, Tenn., they have received orders for three 75 k. w. 250-volt generators.

The Palmetto Cotton Mills, Columbia, S. C., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

The Abbeville (S. C.) Cotton Mills have placed a repeat order for humidifiers with the American Moistening Company, Boston.

The Ipswich Mills, of Ipswich, Mass., have recently ordered from the Crocker-Wheeler Company, of Ampere, N. J., one 250 volt D. C. generator to furnish light for their building.

Tested for Twenty-Five Years.

One of the original fan system heating and ventilating plants installed by the Buffalo Forge Company in Buffalo was placed in the first works built by the Geo. N. Pierce Co., on Hanover St. This outfit was built a quarter of a century ago, and was used in the factory in which the Pierce bicycles have been built. The Pierce buildings have long been overcrowded, and since the fire, which destroyed a part of the Hanover St. plant last winter, plans have been drawn up and contracts let for a fine group of buildings located on the Pan-American site at Elmwood Ave. and the Belt Line, which in equipment and construction will be unexcelled in this country. The entire contract for heating and ventilating all of the buildings in the new Elmwood Ave. plant where the Pierce 1907 cars will be built has been awarded to the Buffalo Forge Company which designed the original installation.

Pennsylvania, Philadelphia. The Kensington Textile Machinery Company, until lately located on Arizona St., has been consolidated with the Diamond Textile Machine Works, to whose address their entire equipment has been removed. The business in the future will be conducted under the name of the Diamond Textile Machine Works at C St., above Westmoreland, where they are manufacturing the James Smith & Co. friction clutches, textile machinery of all kinds, and improved reels, ring twisters, shoddy pickers, lumpers, spoolers, gill box screws, fluted rollers of all descriptions, collars and steps for mules, setting up and lengthening self acting mules, relagging of all makes of cylinders, etc. They also carry a full line of repair parts for all kinds of pickers.

Mill Ventilation.

Mr Osborne, the late factory inspector in England, in referring to the matter of ventilation said that the use of fans, both for blowing in and exhausting air, is the cheapest and most effective system for such buildings as weaving sheds owing to the large cubic space (some containing more than 8,000,000 cubic feet), and the consequent impossibility of bringing uncontaminated air from the side inlets to the central parts.

The point here made will be appreciated when attention is called to the very wide buildings that are now a part of mill construction. It is the ventilation of the central portion that is the most difficult to obtain.

Another English factory inspector, made the remark some time ago that "the figures shown for cotton weaving are of special interest in view of the prophecies freely made not long since to the effect that the increased stringency of the sanitary regulations made in 1898 by the Secretary of State for artificially humidified cotton factories would cause the occupiers of the factories to relinquish the use of artificial humidity rather than comply with the regulations."

"So far from this being the case." he says, "the number of cotton weaving factories with artificial humidity steadily increased," a fact that, he thinks, shows that the improved sanitation insisted upon has not had the inimical effect upon the industry that some people feared.

He mentions a conspicuous example of a manufacturer who installed at a great expense an improved system of ventilation in his weaving sheds, in which nearly 2000 operators are employed. He took a sample of air from the middle of a number of the sheds and found that the carbonic acid therein averaged 7.37 volumes per 10,000 only; a condition as good as that to be found in our best ventilated buildings.

The manufacturer referred to has adopted other improved methods, such as providing a purer steam for moistening purposes and in fitting up electric lighting in place of gas.

The B. F. Sturtevant Co., Boston, Mass., is installing a complete wool conveying system in the Wood Worsted Mills, South Lawrence, Mass., another for the Boston Wool Scouring Co., Boston, an apparatus for drying wool for the Forbes Wool Co., Trinidad, Colo., and an apparatus for drying knit goods for the Utica Knitting Co., Claysville, N. Y.

Removal.

Thomas Leyland & Company, importers and manufacturers of gums, dextrines, calico printers', dyers' and bleachers' supplies have removed to their new offices on the fourth floor in the Dean building, 60 India Street, Boston, Mass.

The Taber Mills, New Bedford, Mass., have adopted the American Moistening Company's system of humidification.

The Dan River Power & Manufacturing Co., Danville, Pa.

The application of electric motors to the operation of textile mills has demonstrated that by this method of drive, great economies are obtained such as increased quantity of goods manufactured as well as the elimination of heavy belts and shafting.

In the cotton industry the rapidly increasing demand for electrical equipments is especially noticeable, one illustration being a recent order from the Dan River Power & Manufacturing Company, Danville, Va., for their new plant, placed with the Baltimore office of the Westinghouse Electric & Manufacturing Company.

The contract is practically a duplicate of the present installation which has been in operation about eighteen months. The new plant when completed will be one of the best electrical installations for cotton mill work in the country. The mills were designed by the well known firm of Lockwood, Green & Company of Boston, and have the latest type cotton mill machinery driven by Westinghouse induction motors.

The power plant is on the Dan River about a mile distant from the mills and will contain when completed three 750 k. w. and three 500 k. w. alternating current, revolving field generators of the water wheel type, with two 125 k. w. direct-current exciters and complete switchboard equipment.

The recent order for new apparatus includes one 750 k. w. revolving field, 6,600 volt, 25 cycle, 3-phase water wheel generator; two 500 k. w. generators with the same characteristics; switchboard equipment; bank of three 600 k. w. oil insulated, water-cooled transformers complete with oil-controlling switch; low tension switchboard; and twenty-four, 440 volt, 3-phase induction motors, which will be used for operating the different machinery in the cotton mills. The sizes of the motors are as follows: fourteen 100 h. p., five 150 h. p., two 50 h. p., two 40 h. p. and one 75 h. p.

The placing of a second order proves conclusively that the present installation of Westinghouse apparatus has given entire satisfaction from every standpoint.

Textile Statistics.

At the National Congress of Textile Workers held in Milan last year it was decided to collect statistics of the textile industry in various countries. The secretary has made the first report in accordance with this plan and gives much interesting information regarding the hours of labor and conditions of employment from which we make the following extracts:

	Hours of labor	Earliest age	House rent per week
France	60 per week	12 to 13	45c to 90c
Austria	11 per day	14	30c to 1.20
Holland	60 to 64½	12	50c average
Belgium	11 per day	13	60c to 1.10

Denmark: Out of 76, 706 operatives in 4,500 firms in Denmark the distribution of the working day is as follows:

4,228 (5.5 per cent.) work 8½ hours or less.
8,963 (11.7 per cent.) work 9 hours or less.
7,602 (9.9 per cent.) work 9½ hours or less.
46,488 (60.6 per cent.) work 10 hours or less.
6,173 (8.0 per cent.) work 10½ hours or less.
3,292 (4.3 per cent.) work 11 hours or more.

So that the great majority of Danish operatives work ten hours. The most favored industry from the point of view of a short work-day is the printing trade, and the least favored the glass-making industries.

Austria: In the matter of trade organization Austria returns as organized operatives:

18,000 weavers and assistants.
1,260 spinners and assistants.
1,500 dyers and assistants.
1,000 lace workers.
2,000 dressers.
1,000 bleachers.
600 embroiderers.

25,360

Holland: In Holland there are employed in the textile industries 49,486, of whom 34,878 are males and 14,608 females. The organized workpeople in the different trade unions (Christian and neutral) are about 5,500, of whom 400 are females. The adult weavers generally run four looms, and some of them six looms, with tenders.

Belgium: In the different branches of industry in Belgium there are 1,130,000 workpeople, of whom 82,444 are men and women operatives who work all day in the workshops, the remainder being employed at their homes. In the textile industry there are 170,000 operatives of both sexes—90,000 in the factories and 80,000 at their homes. The two Flanders are the most refractory provinces as to wages, hours of labor, and trade union organization. The weavers in these provinces, with four looms, earn only $2.60 to $2.85 per week, and those with two looms $1.90 to $2.20. The hours of labor are 66 to 70 per week. The average wages of the spinner are $5 to $5.25 per week; piecers $3.25 to $3.40. Those under 18 years old generally earn $1.16 to $2.12 per week, according to age. In Belgium there are 35 cotton spinning firms, with 1,140,932 spindles, of which Ghent (the Manchester of Belgium) has 725,076.

In the linen industry 12,275 operatives are employed in the different categories, 40 per cent. being under 18 years of age; women and girls 71 per cent. The wages of men are $2.85 per week (average), the women $2.35 to $2.85, and those under 18 years $1.45 to $1.70. In the linen industry the work-day is 66 hours per week. The Textile Federation was founded in 1898, and there were 10,932 members:

Cotton spinners	2,696
Cotton weavers	3,326
Linen spinners	1,400
Carded wool spinners	1,800
Combed wool spinners	1,200
Wool dressers	210
Spinning sewing thread	300
	10,932

In spite of the trade organizations the employers would not recognize the unions nor answer letters. At Ghent they had gone through a 14-weeks' struggle, at a cost of $40,000 for a reduction of a quarter of an hour in the work-day. In the woolen industry there is a guaranteed minimum wage for weavers of 80 cents per day for two looms, and an average of 90 cents per day. In most of the factories the two-loom system has been done away with. The effective work-day is 10 1/4 hours.

Crocker-Wheeler Company, of Ampere, N. J., have received an order from the Columbia University, University Heights, New York City, for one 450 k. w. 250 volt direct current generator for lighting and power for the university.

The Victor Mfg. Co., Greers, S. C., have placed a repeat order for humidifiers with the American Moistening Company, Boston.

The Buffalo Forge Company and the Buffalo Steam Pump Company will abandon their office in Columbus after the first of July, locating in Cincinnati and Cleveland. A. J. Vance will have charge

of their interests in the Cincinnati district and W. A. Rowe at Cleveland.

The Floyd Wells Co., of Royersford, Pa., has placed orders for a 100 k. w. 230 volt generator and three motors of 35, 25 and 20 h. p. respectively, and two motors of 10 h. p. each of 230 volts, with the Crocker-Wheeler Company, of Ampere, N. J.

The Cincinnati interests of the Buffalo Forge Co. and the Buffalo Steam Pump Co. are in charge of A. J. Vance, 403 Neave Building, Cincinnati.

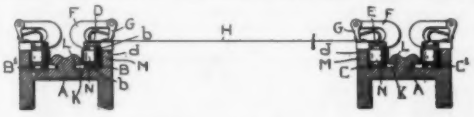
Recent Textile Patents.

CARPET FABRIC. 824,045. Charles C. Stewart, Philadelphia, Pa., assignor of one half to Archibald T. James, Philadelphia, Pa.

CHENILLE MACHINE. 822,704. Charles Wiebke, New York. N. Y.

CLOTH TENTERING MACHINE. 820,746. Chas. L. Taylor, Hartford, Conn.

This invention relates to that class of tentering machines in which a series of cloth-gripping devices are mounted upon the links of an endless chain, are made to travel in longitudinal tracks by which the cloth is stretched and held taut during



the process of drying. Tentering machines of this class are now in common use, and as their construction and operation is well understood by those conversant with the manufacture of textile fabrics, only such portions are shown as relate particularly to the new device, which consists in an improvement in the endless chains of the machine by which the friction of the chains upon their tracks is reduced.

COMBING MACHINE, Cotton. 822,549. Oscar L. Owen, Whitinsville, and Elwin H. Rooney, New Bedford, Mass., assignors to the Whitin Machine Works, Whitinsville, Mass.

COMBING MACHINE. 822,479. Elwin H. Rooney, New Bedford, Mass., assignor to the Whitin Machine Works, Whitinsville, Mass.

COMBING MACHINE, for Cotton and Wool. 823,844. Frank W. Chadderton, Oldham, Eng.

DYEING MACHINE. 822,844. Joseph Hussong, Camden, N. J.

FABRICS, Apparatus for Treating Textile. 823,834. Walter D. West and Victor Mauck, Conshohocken, Pa.

FILAMENTS OF VISCOSE, or Similar Material, Spinning Head for Forming. 823,009. Montgomery Waddell, New York, N. Y., assignor to Silas W. Pettit, Philadelphia, Pa.

LOOM FILLING DETECTING MECHANISM. 823,248. Everett S. Wood, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING DETECTING MECHANISM. 823,251. Arthur E. Benson, Agricultural College, Miss., assignor to Draper Co., Hopedale, Mass.

LOOM HARNESS MOTION. 821,762. Merrill O. Steere, Pawtucket, and Simon W. Wardwell, Providence, R. I., assignors to the Brindle-Steere Co.

LOOM HOPPER ACTUATING MECHANISM, Automatic. 823,627. Jonas Northrop, Hopedale, Mass., assignor to Draper Company, Hopedale, Mass.

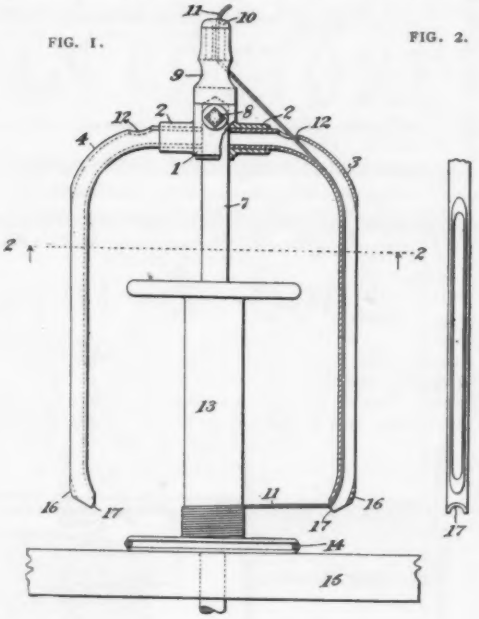
LOOM PILE FABRIC. 822,103. James K. Dalkranian, New York, N. Y., assignor to Nazar Costikyan, New York, N. Y.

LOOM SELVAGE MOTION. 823,638. Charles F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING FLIER. 822,796. Charles Wiebke, New York.

This invention relates to spinning fliers and has for its objects to simplify, improve and cheapen the

FIG. 1. FIG. 2.



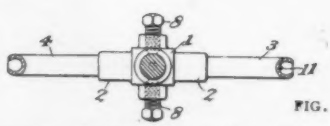


FIG. 3.

construction, lighten the weight, and increase the effectiveness, strength, reliability, and speed of operation of appliances of this class. Fig. 1 is a front elevation of the flier; Fig. 2 in a detail elevation of the lower portion of one of the tubular arms detached; Fig. 3 is a horizontal sectional view of the flier in a plane indicated by the line 2 2 in Fig. 1.

LOOM SHUTTLE, Self Threading. 823,626. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM TAKE UP MECHANISM. 822,818. Frederick Benz, Sr., Haledon, N. J., assignor to Frank & Dugan, Paterson, N. J.

LOOM STOP MOTION. 822,585. John Corbishley, Joseph H. Wood and Timothy F. Collins, Fall River, Mass.

LOOM FOR WEAVING. 12,493. Abraham Tcherniack, New York, N. Y.

LOOM FOR WEAVING PILE FABRIC. 823,698. Andrew G. Robertson, Philadelphia, and John H. Robertson, Cheltingham, Pa.

LOOMS. Electric Warp Stop Motion for. 823,489. George E. Chandler, Taunton, Mass., assignor to Mason Machine Works, Taunton, Mass.

LOOMS, Lug Strap Connection for. 822,321. James Thompson, Somerville, Mass.

MEASURING FABRICS. 821,839. Friedrich C. Stephan, Crimmitschau, Germany.

PILE FABRIC, WOVEN. 823,996. Thomas B. Dornan, Philadelphia, Pa.

SACK OR BAG, and Making the Same, Seamless Bottom. 822,081. Kashichi Sano, Tokyo, Japan.

SEAMLESS BAG OR SACK, and Making the Same. 822,155. Kashichi Sano, Tokyo, Japan.

SILK, Manufacture of Artificial. 823,445. Ernst Schramm, Friedrichshagen, Berlin.

SINGEING MACHINE. 821,676. Henry K. Skevington, William L. Whitehead and William H. Seltzer, Philadelphia, Pa.

SPINDLE. 821,884. James C. Potter, Pawtucket, R. I., assignor to American Spindle Co., Pawtucket, R. I.

SPOOL OR REEL. 822,433. Eugene B. Crocker, Pawtucket, R. I.

The object of this invention is to provide a spool of simple and inexpensive construction that will be practically indestructible and extremely light in weight. Spools for this purpose are obliged to be very strong and durable in order to withstand the

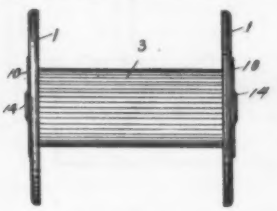


FIG. 1.

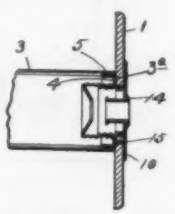


FIG. 2.

rough usage they receive at the hands of careless mill operatives. When heavily laden with wire or yarn, they are often dropped or thrown around, and if not practically indestructible the heads soon become loose or broken and the spool destroyed. In the accompanying drawings, Fig. 1 shows a side elevation of the spool; Fig. 2 is a sectional view showing one end of the spool and illustrating the improved manner of holding the heads in place.

SPINNING MACHINES, Saddle for the Top Rolls of. 822,075. William Rainville, Woonsocket, R. I.

SPINNING AND TWISTING APPARATUS, Ring. 821,641. Joel Hayden, Jr., Boston, Mass., assignor to Hayden Machinery Co.

SPOOLING MACHINE, Jack or Dresser. 822,278. Mark Ingham, North Chelmsford, Mass.

TWISTING MACHINE. 821,814. David Metzger, New York, N. Y.

WASHING, WRINGING, MANGLING MACHINES, Roller for. 822,772. George W. Robinson, Portalegre, Portugal.

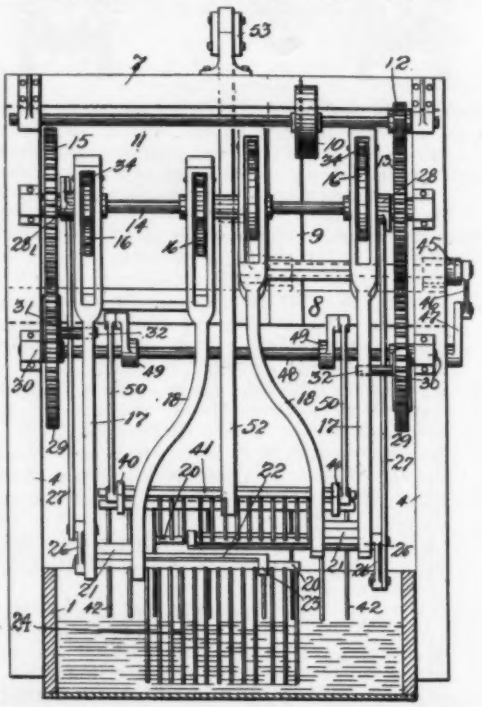
WINDING FRAME, Yarn. 822,086. Percival Taylor, Smithills, Bolton, Eng.

WINDING MACHINE BOBBIN. 822,224. Claes Ryden, Providence, R. I.

WINDING MACHINE, Quill or Cop. 823,789. Heinrich Kauffmann, College Point, N. Y.

WOOL SCOURING MACHINE. 821,139. Joseph H. Tillinghast, Stockton, Cal.

This invention relates to improvements in wool scouring machines, the object being to provide a



machine that will scour wool without imparting to it a rotary or felting motion, but preserving it in an open, loose, or fluffy condition. Also to provide a machine that will operate more rapidly than machines of this character heretofore used, and yet without danger of splashing the liquid on account of too rapid motion of the parts, and will be simple and economical in operation and will not readily get out of order, and in any case can easily be repaired.

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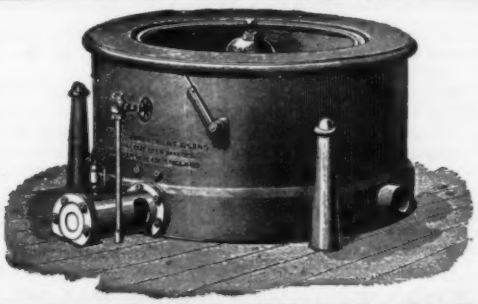

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Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.

Cranes.
Yale & Towne Mfg. Co.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Cameron, James A.
Eastman Machine Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Stafford, G. W., Mfg. Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Vacuum Process Co.

Dry Goods Trucks.
Clark, The Geo. P., Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.
Sterling Blower & Pipe Mfg. Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Fairhill Bleachery.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R., & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Alton Machine Co.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Beaumont's Limited.
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
Hopkins Machine Works.
Hunt, Rodney, Machine Company.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh, Evan A.
Leyland, Thos., & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rice, Barton & Fales Co.
Smith, Drum & Co.
Sirocco Engineering Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Trucks.
Clark, The Geo. P., Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Continental Color & Chemical Co.
Kalle & Co.
Ford, J. B., Co.
Fortner, L. B.
Geisenheimer & Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F., & Co.
Thayer, Ed. M.
West Indies Chemical Works, Ltd.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker-Wheeler Co.
General Electric Co.
Murphy, Harry F., & Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Mass. Fan Co.
Murphy, Harry F., & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Yale & Towne Mfg. Co.

Electric Motors.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

Elevators.
Morse, Williams & Co.
Salem Elevator Works.

Embroidery Machines for Hosiery and Knit Goods.
Walther, Otto.

Employees' Time Recorders.
Pettes & Randall Co.

Engine Stops.
Consolidated Engine Stop Co.

Engineers' Supplies.
Moulton, P. A.

Engravers.
Smith Bros.

Exhaust Heads.
Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Scaife, W. B., & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Scaife, W. B., & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.
The Hungerford Filter Corp.

Feeds.
——See Automatic Feeds.

Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
American Water Softener Co.
Norwood Engineering Co.
Phila. Water Purification Co., The.

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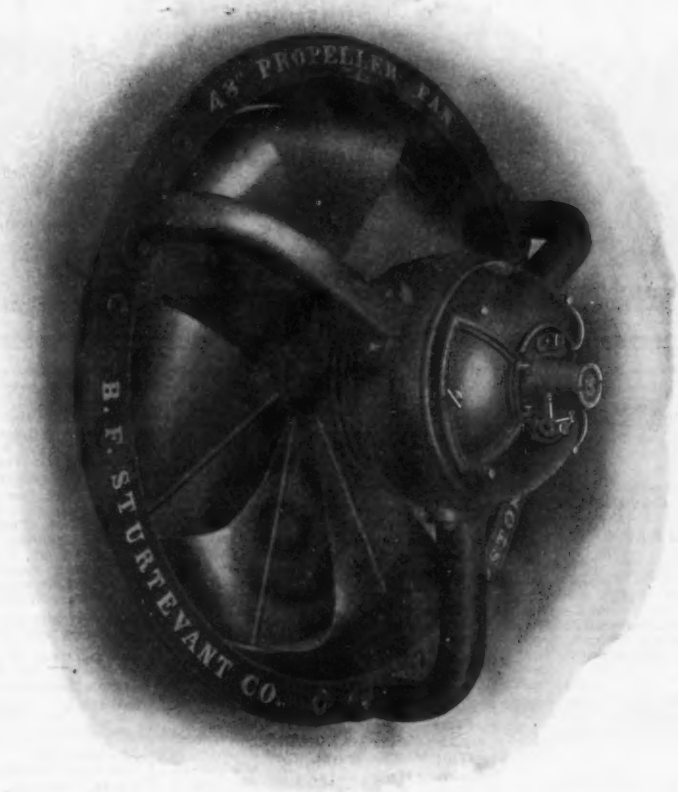
READY FOR A HURRY CALL



Sturtevant Electric Propeller Fans are carried in stock at works and at our New York, Philadelphia and Chicago warerooms. Especially suited for summer ventilation.

B. F. STURTEVANT CO., BOSTON, MASS.

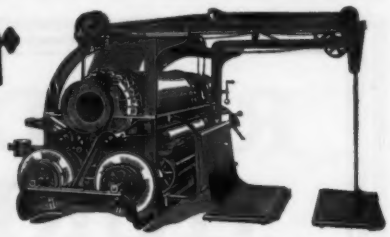
General Office and Works, Hyde Park, Mass.

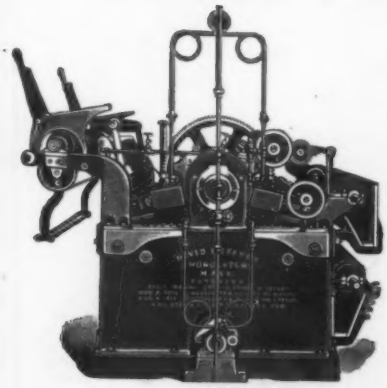
New York Philadelphia Chicago London

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Fuel Economizers; Forges, Exhaust Heads, Steam Traps, Etc. 458

David Gessner

Worcester, Mass.

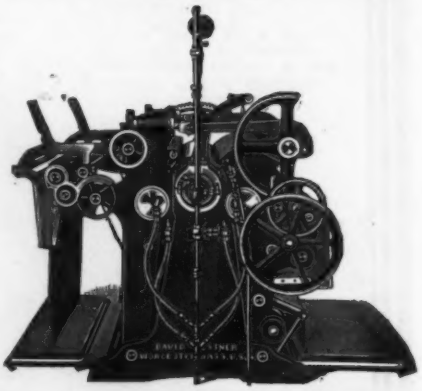




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Scaife, W. B., & Sons.
The Hungerford Filter Corp.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Fire Pumps.
—See Pumps.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Diamond Textile Machine Works.
Hood, R. H.
Leigh, Evan A.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Hopkins Machine Works.
Leigh, Evan A.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
Salvator Transfer, Inc.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.

Garnetts.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Crocker-Wheeler Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W., & Co.

Grease.
Cook's, Adam, Son.

Gut Cords and Strings.
Wentworth, M. W.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Beck, Charles, Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Hunt, Rodney, Machine Company.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance, Fire and for Loss of Profits.
Home Insurance Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John, & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Hunt, Rodney, Machine Company.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

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Our Heddle Eye is solid metal

The warp thread has a smooth steel surface to rest on.

They make no fly and collect none. Every user of our Heddles acknowledges this.

Anything that tends to ease the warp thread is of benefit because it tends to lessen broken warp threads.

One proof that our Heddle is easier on the warp threads lays in the fact that we can crowd 50% more of our Heddles in a given space on the heddle frame than any other heddle made.

Tell us the work you want to do and we will send details.

Steel Heddle Manufacturing Co.

1842 Germantown Ave., Philadelphia.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Hilscher, G.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kinsey, Walter.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Jarrard Needle Company.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orlon.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Leather.
Bowes, L. M., Co.

Loom Pickers.
Garland Mfg. Co.

Loom Repairs and Parts.
Glaser Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.

Lumpers.
Diamond Textile Machine Works.
Gerry, George, & Son.
Schofield, Wm., Co.

Machinery Dealers.
Jefferson, Ed., & Bro.
Kinsey, Walter.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Whitin, The D. E., Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.
Parks & Woolson Machine Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Murphy, Harry F., & Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Glaser Mfg. Co.
Murphy, Harry F., & Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.
Luzern Cotton Yarn Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
—See Architects and Mill Engineers.

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Mill Brushes.
——See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
——See Sewing Machines and Supplies

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son, Gun Mill.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Glaser Mfg. Co.
Jefferson, Ed., & Bro.
Kolb, Frank E.
Lane, W. T., & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W., & Co.
Norwich Belt Mfg. Co.
Philadelphia Drying Machinery Co.
Riley, C. E., Company.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
Turner, J. S., Mfg. Co.
Ward & Vandegrift.
Walworth Manufacturing Co.

Motors.
——See Electric Motors.

Napping Machinery.
American Napping Machine Co.
Birch Bros., Somerville Machine Wks.
Borchers, Richard C., & Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolson Machine Co.
Whiteley, William, & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm., & Co.

Oil Cups.
Tucker, W. & C. F.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Cook's, Adam, Son.
Excelsior Wool Oil Compound Co.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Overseaming Machines.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Richardson Bros.
Smyth, J. L. N., Paper Co.

Paper Boards.
Smyth, J. L. N., Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
Langston, Samuel M.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Murphy, Harry F., & Co.
Pancoast, Henry B., & Co.
Scaife, W. B., & Sons.
Walworth Manufacturing Co.

Pneumatic Conveying.
——See Ventilating.

Power Transmission Machinery.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Cresson, Geo. V., Company.
Evans, G. Frank.
Farrell Foundry and Machine Co.
Hunt, Rodney, Machine Company.
Hunter, Jas., Machine Co.
Kilburn, Lincoln & Co.
Philadelphia Drying Machinery Co.
Plymouth Cordage Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William, & Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Saco & Pettee Machine Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
North Chelmsford Machine Co.
Phila. Drying Machinery Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Printing Machinery (Cloth).
Rice, Barton & Fales Machine & Iron Company.

Pulleys.
——See Power Transmitting Machinery.

Pulley Covering.
Warren Company, The.

Pumps.
Goulds Mfg. Co.
Humphrey Machine Co.
Hunt, Rodney, Machine Company.
Murphy, Harry F., & Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Norwood Engineering Co.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.
The Hungerford Filter Corp.

Quillers.
Foster Machine Co.
North Chelmsford Machine Co.
Payne, G. W., & Co.

Rag Pickers.
Diamond Textile Machine Works.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Garland Mfg. Co.
Walder, J.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Remnants.
Feingold, H. & D.

Ribbons.
Barton, F. C.
Cheney Bros.

Ring Travelers.
DeHaven Mfg. Co.
Shaw, Victor, Ring Traveler Co.

Roofing.
Lincoln Waterproof Cloth Co.
Standard Paint Co.

Roller Coverers.
Turner, J. S., Mfg. Co.

Roller Leather.
Bowes, L. M., Co.
Turner, J. S., Mfg. Co.

Rope.
American Mfg. Co.
Plymouth Cordage Co.

Rope Transmission.
American Mfg. Co.
Cresson, Geo. V., Company.
Hunt, Rodney, Machine Company.
Plymouth Cordage Co.

Roving Cans.
Hill, James, Mfg. Co.

Rubber Rolls.
American Wringer Co.
Clark, Geo. P.

Ruberoid Roofing.
Standard Paint Co.

Scallop Machines.
Merrow Machine Co.

Schools.
Bradford-Durfee Textile School.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Screens (Perforated).
——See under Perforated Metal.

Secondhand Machinery.
——See Mchry. Dealers, also classified Ads.

Separators.
Draper Co., The.

Sewing Machines and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Kinsey, Walter.
Manufacturers' Supplies Co.
Textile Finishing Machinery Co.
Union Special Machine Co.
Walter & Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Barney Ventilating Fan Works.
Scaife, W. B., & Sons.
Sterling Blower & Pipe Mfg. Co.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Rome Metal Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Knapp, Charles H.
Leigh, Evan A.

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TEXTILE MANUFACTURERS
Appreciate good roofing and many can attest to the lasting qualities of
RUBEROID ROOFING
TRADE MARK REGISTERED
STANDARD FOR FIFTEEN YEARS.
It is the original weather-proof, elastic and acid resisting roofing. Resists the great heat and the acid fumes of dyehouses, etc. Highly fire resisting. Contains no tar. Especially useful on saw tooth roofs. Will outlast tin and iron. Let us send you samples and booklet R.
In stock in large cities.
The STANDARD PAINT COMPANY, Sole Mfrs.
100 William St., New York.

Smith, Drum & Co.
Stubbs, Joseph.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
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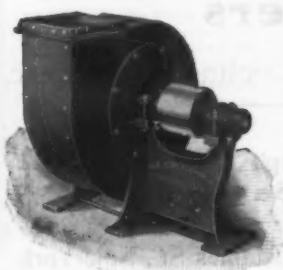

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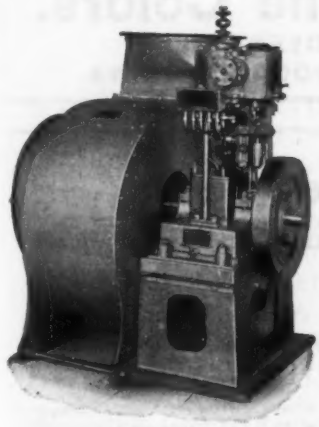

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Address "Miscellaneous," care Textile World Record, Boston, Mass.

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Wanted. Man capable of fixing Knowles looms for heavy material; state if experienced in other lines; steady employment and can later secure an interest in a paying business if desired. Address X, Y, Z, Textile World Record, Boston, Mass.

Wanted. We are continually having calls for first-class superintendents and overseers for knitting and men to fix hosiery machines in large hosiery mills. Any one interested kindly write Overseer's Bureau, Textile World Record, Boston, Mass.

Wanted. First class jacquard designer for elastic and non elastic suspenders. Address, Jacquard, care Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

WOOLEN SUPERINTENDENTS.

Superintendent, assistant superintendent or assistant designer. Position wanted by a man 28 years of age, married, and American. Is experienced on all classes of woolen goods, and is familiar with Crompton & Knowles looms. Good references. 3591, Textile World Record, Boston, Mass.

Superintendent or Assistant Superintendent and Designer. Position wanted by a man 34 years of age, married, English. Is experienced on worsted coatings, woolen cassimeres, amazons, venetians, dress goods, kerseys and beavers. Is familiar with all kinds of woolen machinery. Good references. 3629, Textile World Record, Boston, Mass.

Superintendent or Assistant Superintendent. Position wanted by a man 29 years of age, Scotch. Is experienced on woolens and worsteds, men's and ladies' wear, flannels, homespuns and coverts. Is familiar with Crompton & Knowles looms, Davis & Furber and Johnson & Bassett mules, James Hunter and Smith garnet machines. First-class references. 3615, Textile World Record, Boston, Mass.

Superintendent or Manager of Woolen Mill. Position wanted by a man 47 years of age, married, Scotch. Is experienced on worsteds, fancy cassimeres, homespuns, meltons, thibets, kerseys, overcoatings, cheviots and dress goods. Is familiar with all kinds of woolen machinery. Good references. 3619, Textile World Record, Boston, Mass.

Superintendent or Designer. Position wanted by a man 34 years of age, experienced on worsted suitings, dress goods, cotton worsteds, cassimeres, overcoatings and coverts. Practical in all departments of woolen mills. First-class references. 3076, Textile World Record, Boston, Mass.

Superintendent, Assistant Superintendent and Designer, or overseer of weaving and finishing. Position wanted by a man 33 years of age, American. Is experienced on ginghams, madras, shirtings, linings, lawns, silks and ducks. Is familiar with all kinds of cotton machinery. Good references. 3616, Textile World Record, Boston, Mass.

Supt. or Asst. Supt. Position wanted by a man 45 years of age, married and American. Has worked on cassimeres, wool and cotton worsteds, kerseys, cloakings, meltons and cheviots. Is familiar with all kinds of woolen machinery. Good references. 3523, Textile World Record.

Asst. Supt, or Overseer of Dressing. Position wanted by a man 30 years of age, married and American. Has worked on fancy cotton, woolens and worsteds, and all kinds of high and low grade goods. Is familiar with all kinds of woolen and cotton machinery. Good references. 3537, Textile World Record.

Supt. in Small Mill, or Asst. Supt. and Designer. Position wanted by a man 31 years of age. Graduate of English Textile School, and is experienced on fine fancy worsteds, worsted cheviots, piece dyes for men's wear, having been designer on these goods for past 8 years. Good references. 3545 Textile World Record.

Supt., or Asst. Supt. and Designer. Position wanted by a man 29 years of age, American. Is experienced on all kinds of woolens and worsteds, kerseys, broadcloths, thibets, dress goods, cloakings, suitings, etc. Is familiar with all standard makes of woolen machinery. Good references. 3588, Textile World Record.

Supt. or Asst. Supt. Position wanted by a man 38 years of age, married. Has worked on fancy cotton goods, lenos, broad silks, ribbons, hat-bands, cotton-back satins, pongees, etc. Is familiar with all looms, and all machines used in silk mills. Good references. 3560, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery; 45 years of age; first-class references. 1806, Textile World Record.

COTTON SUPERINTENDENTS.

Superintendent and Designer, or Designer. Young man, American, with 4 years' experience as designer. Worked on shirtings and all kinds of elastic and non-elastic webs, on Crompton and Knowles, broad and narrow looms. Will accept a good position anywhere in United States. 3359, Textile World Record, Boston.

Superintendent of Bleachery. Worked on all kinds of lawns, lenos and colored lawns, towels, colored and white ducks, drills, tickings, shirtings and hosiery. Familiar with all kinds of bleaching machinery; first-class references; 55 years of age. 3245, Textile World Record.

Superintendent and Designer wants position as manager. Experienced designer and practical man for the tie-up of looms for weaving ribbons, silk, upholstery and cotton goods, plain and jacquard cloths. 20 years' experience as manager and understands a mill in all its branches. Knows the coloring for stripes and figured upholstery, cotton, silk and ribbon novelties a special. 3423, Textile World Record, Boston.

Cotton Superintendent or assistant superintendent. Worked on linen and union towels and crashes. Father now taking full charge of the business, so he is not needed. Worked on Crompton & Knowles and other machinery used in toweling manufacture. Age 28; first-class reference. 1867, Textile World Record.

Agent or Superintendent, cotton or woolen mill. 52 years of age, American. Worked on men's wear, overcoatings, dress goods, plain cotton goods and fancy shirtings, most all kinds of woolen and cotton machinery. 3457, Textile World Record, Boston.

Superintendent of Bleaching and finishing works. Has experience on Nottingham, Irish point, bobbinet and renaissance curtains a specialty. Also Swiss dots, organdies, lace handkerchiefs, embroideries, etc. Thoroughly understands aetying, carbonizing and dyeing. A practical man, no experidesigner. Worked on shirting and all kinds of menter. 3443, Textile World Record, Boston.

Superintendent or Assistant Superintendent. Position wanted by a man 31 years of age, married, American. Is experienced on men's half hose, ladies' work and rib top, boys' and misses' ribbed and infants' cassimere silk tip hose. Is familiar with Acme, Hemphill, Scott & Williams, Brinton, Wildman, Nye & Tredick, Campbell & Clute and other knitting machinery. Good references. 3643, Textile World Record, Boston, Mass.

Superintendent of Print Works, or Color Mixer, Printer, Bleacher and Mercerizer. Position wanted by a man 31 years of age, married, Scotch. Has worked on organdie lawns, shirtings, sateens, skirtings, etc. Is familiar with all kinds of drying starch manglers, etc. Rusden and Butterworth tenter machines, and all kinds of machinery used in print works. Good references. 3641, Textile World Record, Boston, Mass.

Superintendent or Carder and Spinner. Position wanted by a man 46 years of age, married, American. Is experienced on all kinds of regular white goods and grain bags, and is familiar with cotton and cotton waste stock. Is familiar with Kitson & Atherton pickers, Biddeford and English frames, revolving roller and top flat cards, Biddeford, Whitin and Lowell. Good references. 3624, Textile World Record, Boston, Mass.

Superintendent of cotton or woolen yarn mill or shoddy plant. Position wanted by a man 50 years of age, who has had a wide experience in the manufacture of yarns. Understands all makes of cotton and woolen machinery, also held position as superintendent in large knitting mills, and is familiar with the American makes of knitting machines. First-class recommendations. 3249, Textile World Record, Boston, Mass.

WOOLEN CARDERS.

Overseer of Carding. Position wanted by a man 31 years of age, married, American. Has worked on all wool, cotton and shoddy mixes. Is familiar with Davis & Furber and Furbush carding machinery. Good references. 3626, Textile World Record, Boston, Mass.

Overseer of Carding, Charge of Shoddy Mill, or Felt Carder. Position wanted by a man 54 years of age, married, American. Has worked on all kinds of woolen shoddy and cotton mixes and is familiar with all makes of carding machinery. Good references. 3630, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 36 years of age, married, American. Has worked on wool, cotton and shoddy mix goods, and is familiar with all kinds of woolen cards. First-class references. 3618, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 30 years of age, married, American. Has worked on all kinds of woolen, cotton and shoddy mix goods and felts. Is familiar with all makes of American and English carding machinery. Good references. 3636, Textile World Record, Boston, Mass.

Second Hand in Card Room. Position wanted by a man 25 years of age, and American. Has worked on dress goods, cloakings, cassimeres, all wool, cotton and wool, and shoddy. Is familiar with Davis & Furber, English cards, aprons, roller condensers and balling heads. Good references. 3509, Textile World Record, Boston, Mass.

Overseer of Carding and spinning. Position wanted by a man 40 years of age, American. Has worked on all kinds of stock, cotton, wool and shoddy, and all numbers of yarn from 7/8 to 8 run. Is familiar with Davis & Furber, Johnson & Bassett, Lombard, and Cleveland carding and spinning machinery. Good references. 3577, Textile World Record, Boston, Mass.

Overseer of Carding and spinning. Position wanted by a man 40 years of age, married. Is experienced on all kinds of stock and all numbers of yarn. Is familiar with Davis & Furber, Johnson & Bassett, Furbush, and Bridesburgh carding and spinning machinery. Good references. 3580, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 34 years of age, married. Has worked on all wool, wool cotton and shoddy mixes, cassimeres, kerseys, cheviots, cloakings, etc. Is familiar with all makes of American cards. Good references. 3562, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 31 years of age and married. Has worked on kerseys, meltons, beavers, ladies' dress goods, men's suitings, all kinds of knit goods, and thoroughly understands all kinds of mixes and stock. Is familiar with all kinds of woolen carding machinery. Good references. 3530, Textile World Record, Boston, Mass.

Overseer of Carding and spinning. Position wanted by a man 36 years of age, married and American. Has worked on cassimeres, flannels, overcoatings, knickerbockers, blankets and carpet yarns. Is familiar with American and English cards and Davis & Furber and English mules. Good references. 3539, Textile World Record, Boston, Moss.

Overseer of Carding. Position wanted by a man 42 years of age, married. Has worked on sackings, satinets, etc., and is familiar with Davis & Furber cards. First-class references. 3555, Textile World Record, Boston, Mass.

Boss Carder and Spinner. Worked on all kinds of woolen and cotton and shoddy mixes; also knitting yarn. Familiar with Davis & Furber cards and mules, Johnson and Bassett, Lombard and Cleveland cards and mules. First-class recommendations; 36 years of age; American. 3302, Textile World Record, Boston, Mass.

Overseer of Carding. American with experience, wants first-class position. Worked on nearly all classes of woolen goods and on machinery used in woolen card room. Best of references. Wants position in the North. $4.00 per day. 3361, Textile World Record, Boston.

WOOLEN SPINNERS.

Overseer of Spinning. Position wanted by a man 36 years of age, married, English. Has worked on all kinds of wool, cotton and shoddy mixes, and is familiar with English mules, Johnson & Bassett mules and jacks. Good references. 3622, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 49 years of age, married. Has worked on all wool, shoddy mixes, second spinning, double and twist, yarns, from 3/4 run to 12 run. Is familiar with Davis & Furber spinning machinery. First-class references. 3633, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 48 years of age, English. Has worked on all classes of woolen goods, and is familiar with Johnson & Bassett, Davis & Furber and Platt spinning machinery. Good references. 3522, Textile World Record, Boston, Mass.

Overseer of Spinning, twisting, spooling and reeling. Position wanted by a man 28 years of age, married and American. Has worked on army and navy goods, fine and heavy woolen and merino yarns, fine worsteds, and low stock shoddy and cotton mixes. Is familiar with Davis & Furber, James Smith, Whiteley, English Bridesburgh, and Platt mules. Would prefer a position near Philadelphia. Good references. 3517, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 30 years of age, married and American. Has worked on cotton, wool, shoddy and all grades of mixes from 7/8 run to 9. Is familiar with almost every make of spinning machinery. Good references. 3538, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 36 years of age. Has worked on all kinds of woolen goods and is familiar with Davis & Furber mules. First class references. 3549, Textile World Record, Boston, Mass.

Boss Carder and Spinner in a Woolen Mill. Familiar with all grades of woolen and mixed goods. Familiar with all makes of American carding and spinning machinery. Will not go West or South; 40 years of age; first-class recommendations; American. 3294, Textile World Record, Boston, Mass.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Wool Spinning. 39 years of age, with 15 years' experience as overseer on flannels, cassimeres, cheviots, kerseys and cotton mixes. Also on all machinery used in his work. Wants position in the East. 3434, Textile World Record.

Overseer of drawing and spinning. Position wanted by a man, English, 37 years of age, married. Worked on superfine and fine merinos, demi lustres, mohair, etc. Familiar with Prince, Smith, Hall & Stells, J. B. Farrars and Lowell Machine Shop machinery. Good references. 3478, Textile World Record, Boston.

Overseer Drawing, Spinning or Twisting. American, 35 years of age, with a number of years' experience, wants position. Worked on nearly all grades of yarns from fine to coarse, and on nearly all machinery used in this work. 3345, Textile World Record, Boston.

Overseer of Spinning. Position wanted by a man 26 years of age, American. Has worked on all classes of goods from 3/4 run mohair to 6 and 7 run, including cotton and wool mixes. Is familiar with Johnson & Bassett and Davis & Furber spinning machinery. Good references. 3563, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 30 years of age; English. Has worked all kinds of stock, cotton, wool and shoddy, from 5/8 run to 13 and is familiar with Davis & Furber mules and operators. Good references. 3595, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 37 years of age; married and American. Has worked on all kinds of wool, cotton and shoddy mixes. Is familiar with Davis & Furber and Johnson & Bassett spinning machinery and operators. Good references. 3603, Textile World Record, Boston, Mass.

WOOLEN WEAVERS.

Overseer of Weaving. Position wanted by a man 41 years of age, married, German. Has worked on wool and worsted goods of all descriptions, and is familiar with Crompton & Knowles and Crompton Thayer looms. First-class references. 3634, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a steady, strictly temperate and reliable married man. Has a good record for being a manager of help and a hustler for production. Worked in last place 12 years on all kinds of woolen goods; is now employed. Used to Crompton & Knowles and Crompton & Thayer looms. 3623, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 40 years of age, married, English. Has worked on all kinds of woolen and worsted goods. Is familiar with Knowles and Crompton looms. Good references. 3647, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 45 years of age, and married. Has worked on all classes of woolen and worsted goods, such as kerseys, beavers, flannels, fancy cassimeres, fancy worsteds, men's wear, serges, dress goods, etc. Is familiar with Crompton & Knowles looms. First-class references. 3646, Textile World Record.

Overseer of Woolen Weaving. Position wanted by a man 38 years of age, married, American. Worked on fancy woolens and worsteds, fancy tweeds, shawls, flannels and beavers. Good references. 3550, Textile World Record.

Overseer of Weaving. Position wanted by a man 32 years of age and married. Has worked on woolen dress goods, suitings, cotton worsteds, worsted dress goods, kerseys, beavers and blankets. Is familiar with Crompton, Knowles, Furbush, Davis & Furber looms and dobby looms. Has first-class recommendations. 3544, Textile World Record.

Overseer of Weaving. Position wanted by a man 38 years of age, American, married. Has worked on woolen and worsted goods and is familiar with Crompton & Knowles looms. Good references. 3498, Textile World Record.

Overseer of Woolen Weaving. 18 years' experience as overseer. Worked on cassimeres, cloakings, chinchillas, cheviots, beavers, meltons, shawls, also worsteds and on Crompton and Knowles looms, wants a position in the East. Good references. 3422, Textile World Record, Boston.

Overseer of Weaving. American, 28 years of age, with experience on all classes of woolen goods and on Crompton and Knowles, Crompton and Thayer looms, wants position in the East. 3357, Textile World Record, Boston.

Overseer of Weaving or Asst. Supt. Position wanted by a man 48 years of age, married. Has worked on all kinds of fancy woolen and worsted goods, wool and cotton and wool and shoddy mixes, and fancy cotton dress goods; can also design. Is familiar with Crompton & Knowles looms, Gilbert looms and dobby-heads, and Whitin plain and fancy looms. Has good references. 3501, Textile World Record.

Overseer of Weaving. Position wanted by a man 28 years of age, single and Scotch. Has worked on wool and worsted, and union goods, blankets, shirtings, rugs, etc. Is familiar with Crompton & Knowles, also English looms and dobbies. Has good references. 3507, Textile World Record.

Overseer of Weaving. Position wanted by an American, 39 years of age, single. Worked on worsted, plain and fancy cassimeres, dress goods and overcoatings. Is familiar with Crompton & Knowles and Crompton & Thayer looms. 3473, Textile World Record.

Overseer of Weaving. Position wanted by a man. American, 45 years of age and married. Has worked on dress goods, cloakings, flannels, meltons and unions. Is familiar with Crompton & Knowles and Stafford looms. Good references. 3494, Textile World Record, Boston.

Overseer of Weaving or designer. Familiar with all kinds of dress goods, lenos, lappets or any kind of fancy Jacquard weaving. Understands all kinds of English and American machinery. Age 46; English; first-class references. 3267, Textile World Record.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American; 45 years of age. 3262, Textile World Record.

FINISHERS.

Overseer of Finishing. Position wanted by a man 32 years of age, married, American. Has worked on all kinds of cotton worsteds, fancy and piece dyed worsteds and woolens. Is familiar with all kinds of finishing machinery. Good references. 3642, Textile World Record, Boston, Mass.

Overseer of Cotton Finishing. Position wanted by a man 37 years of age, married, Swede. Has worked on all kinds of cotton goods, plaids and stripes, in all departments of the finishing room. Is familiar with Butterworth finishing machinery. Good references. 3638, Textile World Record, Boston, Mass.

Overseer of Finishing. Age 30, American, unmarried, with 6 years' experience as overseer, wants position in New England. Had experience on satinets, unions, and all goods where cotton warp is used, also on nearly all machinery used in making these goods. 3335, Textile World Record.

Overseer of Finishing. 37 years of age, with experience in some of the best mills in New England. Worked on all kinds of woolen and worsted face finished goods and on about all kinds of machinery used in finishing room. Prefers the East. 3344, Textile World Record.

Overseer of Woolen Finishing or assistant superintendent. American, 45 years of age, with knowledge of designing; understands figuring yarns and lay outs; worked on beavers, kersey, woolen and worsted suitings, dress goods, coverts, cassimeres, cheviots, etc., and on all kinds of machinery used in his business. 3415, Textile World Record.

Overseer of Woolen Finishing. 33 years of age, married, with experience on beaver, kersey, cassimere, covert, thibet, worsted, dress goods, government goods, etc. Understands Curtis & Marble, Park & Woolson machines. 3402, Textile World Record.

Overseer of Finishing. American, first-class in every respect, with good references, wants position. Is accustomed to all classes woolen and worsted goods and all kinds of machinery used in his work. 3383, Textile World Record.

Overseer Finishing, or Stock Dyeing and Finishing. Worked on Union cassimeres, satinets, all wool cassimeres, cheviots, dress goods, meltons and kerseys; 39 years of age; single; Scotch, with first-class reference from past employers. 3449, Textile World Record.

Overseer or Woolen Finisher. 42 years of age, with experience on kerseys, meltons, thibets, beavers, broadcloths, worsteds, dress goods and on nearly all classes of woolen and worsteds, wants position in the East. Worked on all machinery used in modern mill in this work. 3432, Textile World Record.

Woolen Boss Finisher. Wet or dry. Worked on meltons, kerseys, friezes, cheviots, fancy cassimeres, thibets, men's and ladies' wear, fancy and cotton worsteds, broadcloths, flannels, blankets and rain cloth. First-class references. Age 35; English. 3113, Textile World Record.

Boss Finisher. Worked on broadcloth, cheviots, kerseys, coverts, thibets, meltons, piece dyes and dress goods. Familiar with all kinds of finishing machinery; prefers a position in Massachusetts. Age 28; American; first-class references. 3046, Textile World Record.

Overseer of Finishing. Worked on kerseys, frigos, cheviots, thibets, cattes, worsted union cassimeres, ladies' dress goods of both high and low stock. Familiar with all kinds of finishing machinery. 29 years of age, married and American. Good references. 3315, Textile World Record.

Overseer of Finishing. Position wanted by an American, 40 years of age and married. Worked on all kinds of woolen and worsted goods and satinets. Familiar with all kinds of finishing machinery. 3475, Textile World Record, Boston.

Overseer of Finishing. Position wanted by an American, 29 years of age, not married. Worked on all kinds of dress goods, face finish worsteds, cheviots and piece dyeing. Familiar with Parks & Woolson, Hunter and all kinds of American machinery. Has good references. 3476, Textile World Record, Boston.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

COTTON CARDERS.

Overseer of Carding. Position wanted by a man 54 years of age, married. Has worked on shirtings and sheetings from 2 to 10 hank roving. Is familiar with all makes of modern carding machinery. Good references. 3561, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 40 years of age, married. Has worked on all kinds of cotton goods and is familiar with all kinds of cotton carding machinery. Good references. 3541, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 35 years of age, married. Is experienced on carded and combed cotton, Peeler, Egyptian, Sea Island, both for yarns and cloth, in coarse or fine numbers. Is familiar with English and American cards and speeders, and American pickers. Good references. 3558, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Position is wanted by a man 38 years of age, married, English. Worked on a variety of cotton goods and on American and English machinery. Good references. Could take a position in one week's notice. 3547, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Position wanted by a man 49 years of age, married, French American. Worked on coarse and fine cotton goods and all numbers on all makes of machinery. Good references. Will not go South. 3551, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Worked on plain and fancy, coarse and fine white goods. Wants only Rhode Island or Connecticut. 47 years of age; married. First-class references. 1884, Textile World Record.

Overseer of Cotton Carding. 40 years of age; married; worked on yarns, sheetings, ginghams, in some of the best mills in this country and good references from mills where employed. 3450, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

COTTON SPINNERS.

Overseer of ring spinning, spooling and warping. Position wanted by a man 32 years of age, American. Has worked on denims, plaids, awnings, checks, lawns, sheetings, lenos, shirtings, etc. Is familiar with Mason, Whitin, Lowell, Davis & Furber and Fales & Jenks, spinning machinery. Good references. 3604, Textile World Record, Boston, Mass.

Overseer of Spinning, Spooling, Warping. Position wanted by a man 35 years of age, married, American. Has worked on all kinds of cotton yarns, from 20s to 120s. Is familiar with Fales & Jenks, Mason, Whitin, Saco & Pettee, and Lowell spinning machinery. Good references. 1788, Textile World Record, Boston, Mass.

Overseer of Spinning. Spooling, Warping. Position is wanted by a man 35 years of age, married, American. Has made yarns from 8s to 80s on all makes of spinning machinery. Worked on all makes of spooling, warping, twisting machines. 3468, Textile World Record, Boston.

Overseer of Mule and Ring Spinning. Position wanted by a man, English, 35 years of age and married. Worked on hosiery, coarse and medium and fine yarns, more accustomed to medium yarns. Is graduate of a textile school and familiar with Parr & Platt mules, Mason mules and Whitin and Lowell frames. 3483, Textile World Record, Boston.

Overseer of Frame or mule spinning and twisting. Position wanted by a man 46 years of age, married and American. Has worked on sateens, twills, 30 warp, 46 filling yarns from 3s to 150s. Is familiar with all makes of spinning and twisting machinery. Good references. 3582, Textile World Record, Boston Mass.

Overseer of Ring Spinning, spooling and warping. Position wanted by a man 38 years of age, married and American. Has worked on plain and fancy goods, all numbers of yarn, combed and carded. Is familiar with Mason, Whitin, and Fales & Jenks machines. Good references. 3018, Textile World Record, Boston, Mass.

COTTON WEAVERS.

Overseer of Weaving. Familiar with shirtings, sheetings, lawns, cambric, ginghams, checks and stripes, union goods, awnings, ducks, drills, light and heavy weight, plain and fancy flannels. 39 years of age, American, first-class references. 3257, Textile World Record, Boston, Mass.

Overseer of Weaving and Designing. Worked on plain and fancy goods, also jacquard work. First-class recommendations, 33 years of age, English. 1397, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving. Worked on lenos, checks, plaids, fancy stripes, drop box and plain looms. First-class references. Will not go West or to Canada. **Age 36, English. First-class references. 1855, Textile World Record.**

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married; worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Silk Weaving. Worked on all kinds of plain silk goods. Familiar with Crompton & Knowles, Stafford & Thayer looms. Good references. 3303, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. **Age 43; Scotch; married. 3216, Textile World Record.**

Overseer of Weaving or designer. **Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recommendation. 3068, Textile World Record.**

DESIGNERS.

Designer. Position wanted by a man 34 years of age, married, American. Is experienced on dress and tie silks, cotton and silk goods, novelty fabrics and ribbons, woolen and worsted Jacquard work. Is familiar with Crompton & Knowles, Stafford, Schaum & Uhlinges Jacquards. First-class recommendations. 3635, Textile World Record, Boston, Mass.

Designer and Assistant Superintendent. Position wanted by a man 36 years of age, married. Is experienced on cheviots, meltons, kerseys, dress goods, overcoatings, cassimeres, piece dyes, etc. Is familiar with all kinds of machinery used in these goods. Good references. 3631, Textile World Record, Boston, Mass.

Designer on Webbing, or Asst. Supt. in a cloth mill. Position wanted by a man 23 years of age, American. Is experienced on worsted and cotton goods, but mostly in the webbing business. Is a graduate of the Lowell Textile School and is familiar with Crompton & Knowles looms. Good references. 3578, Textile World Record.

Designer or Asst. Supt. Position wanted by a man 34 years of age. Has worked on fancy worsteds, cheviots, overcoatings, and cotton worsteds. Is familiar with Crompton & Knowles looms. Good references. 3518, Textile World Record.

Designer. Position wanted by an American, 28 years of age and married. Worked on checks, plaids, madrases, cheviots, woolen and worsted suitings, fancy ginghams, gauzes, lenos, spot effects and novelties, etc. Is familiar with Crompton & Knowles plain and dobby looms, Mason plain and dobby looms and Kilburn & Lincoln plain looms. Good references. 3482, Textile World Record, Boston.

Designer and Assistant Superintendent. Position wanted by a man 31 years of age, married, Scotch. Is experienced on cassimeres, cheviots, coverts, outing rain coatings, piece dyes and has had some experience on worsteds. Is familiar with Crompton & Knowles looms. Good references. 3625, Textile World Record, Boston, Mass.

KNITTERS.

Manager or Superintendent in underwear mill. Position wanted by a man 50 years of age, married and American. Has worked on fancy balbriggans and flat goods. Is familiar with Davis & Furber, and Campbell & Clute knitting machines. Was once in business for himself. Good references. 3519, Textile World Record, Boston, Mass.

Overseer of Knitting and finishing, or assistant superintendent. Position wanted by a man 40 years of age and married. Is experienced on all kinds of knit goods, more especially on ribbed underwear, silk hosiery, knit gloves and mittens. Is familiar with Nye & Tredick, McMichael & Wildman, Brinton, Scott & Williams knitting machines and all kinds of sewing machines, lace bar machines, and German Terrot loopers. First-class references. 3556, Textile World Record, Boston, Mass.

Overseer of Knitting. Position wanted by a man 34 years of age, English. Has worked on sweaters, jerseys and union suits. Is familiar with Pepper, Nye & Tredick, and Stafford & Holt knitting machines. Good references. 3621, Textile World Record, Boston, Mass.

Overseer of Knitting. Position wanted by a man 25 years of age, married, Canadian. Has worked on all kinds of fancy and plain ribbed underwear made on latch needle machines, men's, women's and children's, cotton, wool, lisle, mercerized and silk underwear. Is familiar with Stafford & Holt, Nye & Tredick, Snyder & Fisher, Wildman, Scott & Williams. Good references. 3640, Textile World Record, Boston, Mass.

General Superintendent of a Knitting or Yarn Mill. Position wanted by a man 54 years of age, married, American. Is experienced on all kinds of goods in weaving mill, cotton and wool mixes in flat knit and cotton fleeced underwear. Is familiar with Davis & Furber cards and mules, Tompkins, and Campbell & Clute knitting machinery. First-class references. 3614, Textile World Record, Boston, Mass.

Superintendent of a Knitting Mill. Position wanted by a man 55 years of age. Is experienced on all kinds of wool and merino underwear. Is familiar with all kinds of knitting machinery. Good references. 3620, Textile World Record, Boston, Mass.

Superintendent of Knitting Mill. Position wanted by a man 26 years of age, married, American. Is experienced on men's overshirts, balbriggan ribbed goods, fleece and novelties, and is familiar with all kinds of knitting machinery. Good references. 3637, Textile World Record, Boston, Mass.

Superintendent of Knitting Mill. Position wanted by a man 43 years of age, married, American. Is experienced on all classes of knit underwear, including fleece lined. Is familiar with Tompkins, Cooper, Snyder & Fisher knitting machines. Good references. 3645, Textile World Record, Boston, Mass.

Manager of Knitting Mill. Position wanted by a man 46 years of age, married, American. Has manufactured all classes of underwear on spring and latch needle, fleece lined, and is familiar with all kinds of knitting machinery. First-class references. 3646, Textile World Record, Boston, Mass.

Overseer of Knitting or knitting machine fixer. Position wanted by a man 22 years of age, English. Has worked on ladies' and gentlemen's fine knit underwear. Is familiar with Cooper Rib Circular and Cooper Circular Cuff machines. Good references. 3597, Textile World Record, Boston, Mass.

Overseer of Knitting, spring needle preferred. Position wanted by a man 25 years of age. Single, American. Worked on spring needle work men's, boys', ladies' balbriggan gauges, ranging from 24 to 36. Fleece goods gauges from 18 to 30. Flat goods, 16 to 20. Latch needle goods, men's, boys', ladies', misses' cotton goods from 8 to 10. Good references. 3553, Textile World Record, Boston, Mass.

Overseer of Knitting or machine fixer. Position wanted by a man 24 years of age, married, and an American. Has worked on all grades and styles of men's, women's and children's underwear. Is familiar with McMichael & Wildman, Nye & Tredick, Stafford & Holt, Leighton, Champion, Scott & Williams, Lamb and Grosser knitting machines, and nearly every kind of sewing machines. Has first-class references. 3505 Textile World Record, Boston, Mass.

DYERS.

Overseer of Dyeing. Position wanted by a man 48 years of age, married, Scotch. Has worked on all kinds of woolen and worsted goods, stock, yarn and piece dyeing. Is familiar with all kinds of dyeing machinery. Good references. 3632, Textile World Record, Boston, Mass.

Overseer of Dyeing, Bleaching and Scouring. Position wanted by a man 35 years of age, married, American. Has worked on all kinds of knit goods, cassimeres, worsteds dyed in raw stock and in piece. Is familiar with all kinds of dyeing, bleaching and scouring machinery. Good references. 3644, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 32 years of age, married. Makes a specialty of fast black on hosiery and yarns, rumble and silk finish, also fancy colors and bleaching. Is familiar with all kinds of machinery used in hosiery and yarn dyeing. Good references. 3559, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 37 years of age, married and American. Has worked on all grades of raw stock, wool, shoddy, cotton and silk noils, pieces for men's wear, dress goods, overcoatings, cloakings, cotton and worsted yarns. Is familiar with all makes of dyeing machinery. Good references. 3548, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 40 years of age, married and an American. Has worked on wool and cotton yarns, and piece dyeing. Is familiar with all kinds of dyeing machinery. Has good references. 3506, Textile World Record, Boston, Mass.

Overseer Dyeing. Englishman, 33 years of age, with 10 years' experience in this country. Worked on broadcloths, dress goods, kersey, carriage cloth, cotton warp, piece dyes, unions, raw stock, wool, cotton and shoddy, also yarn. 3349, Textile World Record, Boston.

Dyer. Scotch; married. Cotton and wool skein and hosiery. Mercerizing and bleaching. Excellent references. 3141, Textile World Record.

MISCELLANEOUS.

Overseer of Dressing, Spooling, Winding, Twisting and Drawing In. Position wanted by a man 33 years of age, married, German. Has worked on fancy worsteds, fancy cassimeres, cheviots and piece dyes. Is familiar with Davis & Furber and Cleveland machinery. First-class references. 3627, Textile World Record, Boston, Mass.

Overseer of Dressing, Spooling, Slashing, Beaming, Drawing In and Quilling. Position wanted by a man 42 years of age, married, Canadian. Has worked on denims, ticking, sheeting, shirtings, flannelettes, ginghams, dress goods, etc. Is familiar with all kinds of machinery. Good references. 3115, Textile World Record, Boston, Mass.

Loom Fixer. Position wanted by a man 29 years of age, single, Swede. Has worked on all kinds of woolen goods, and is familiar with Knowles looms. First-class references. 3648, Textile World Record, Boston, Mass.

Overseer of Combing. Position wanted by a man 27 years of age, married, English. Has worked on men's wear and fancy dress goods. Is familiar with Noble combs of all makes, Crompton, Taylor, Wadsworth, Smith and Prince. Good references. 3617, Textile World Record, Boston, Mass.

Bookkeeper or Traveling Salesman would invest some money in a paying proposition. 54 years of age, married, American. 3472, Textile World Record, Boston.

Overseer of Dressing, Spooling and Twisting. Position wanted by a man 33 years of age, married, English. Has worked on all kinds of woolen and worsted goods, dress goods and men's wear. Is familiar with Cleveland and Davis & Furber machinery. Good references. 3639, Textile World Record, Boston, Mass.

Overseer of Grey Room. Position wanted by a man 33 years old. Worked on cottons, cotton warps, worsteds, woolens, and silk warp goods. Could take position at one week's notice. Good reference. 3488, Textile World Record.

Overseer of dressing. American; married. Wool, worsted and cotton worsteds. 3165, Textile World Record.

"PLYMOUTH" Transmission Rope

ONLY the highest grades of Manila hemp enter into this the highest grade Transmission Rope.

This condition, supplemented by top-notch workmanship and the "know how" developed by years of study and experience, results in the production of a rope for power transmission that is near perfection and that careful tests will show gives the maximum of service for a given expenditure.

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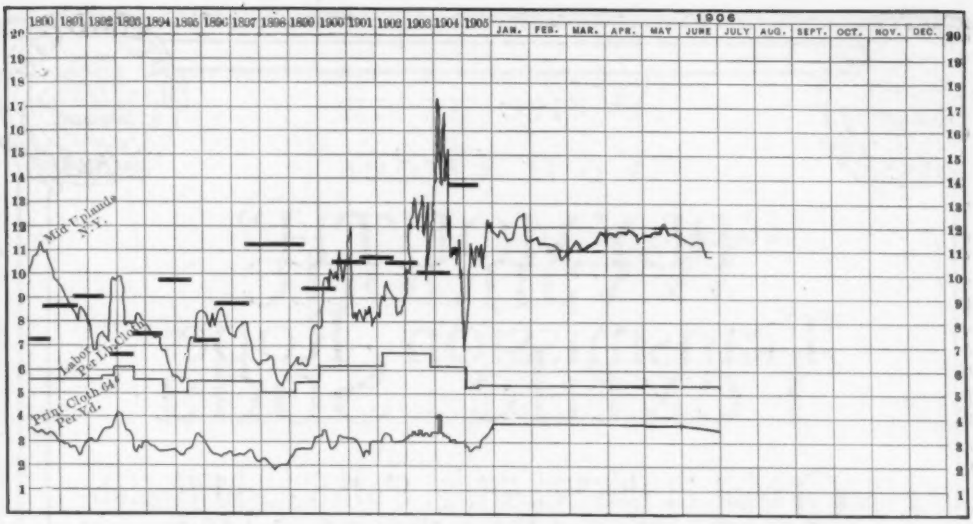
North Plymouth, Mass.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The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

Favorable weather throughout the cotton belt has caused prices to sag. The crop of 1906-07 is now developing and not even the most daring plunger has the courage to risk running counter to the natural resources of the Southern field. A larger acreage has been planted and it needs but the right conditions to bring the world a crop equal to or in excess of the 14,000,000-bale yield of 1904-05. These conditions are far from being assured. Unfavorable weather may yet bring the yield to the other extreme.

The total visible supply on June 29 is estimated by the Chronicle at 3,098,081 bales, as compared with 3,436,233 bales on corresponding date in 1905, 2,074,931 bales in 1904, and 2,262,653 bales in 1903.

The same authority gives the movement into sight to June 29 for a series of years as follows:

1905-06	10,429,190 bales.
1904-05	12,484,402 bales.
1903-04	9,842,043 bales.
1902-03	10,083,270 bales.
1901-02	10,061,182 bales.

*Georgia, Dalton. Site has been purchased and arrangements will be made for starting erection of new buildings for the Elk Cotton Mills. This company is capitalized with $200,000, J. W. Barrett, president; Frank T. Hardwick, vice-president and J. E. Satterfield, treasurer.

*Massachusetts, New Bedford. At a special meeting of the stockholders of the Taber Mill, it was voted to increase the capital stock from $350,000 to 410,000.

New York, Utica. The La Tosca Knitting Company is to erect a plant for manufacturing combed cotton yarns. A new building, 240 by 100 feet, three stories, brick, will be erected and operated as the La Tosca Yarn Mill. D. W. Gray will be superintendent of the new plant.

WONALANCET COMPANY
NASHUA JUNCTION, N. H.
Manufacturers of a superior grade of
CARDED COTTON
Gulf and Peruvian—in the white
To Meet the Most Exacting Needs of
WOOLEN MILLS

WEIMAR BROS.
MANUFACTURERS OF
Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections.
Works, 2046-48 Amber Street, PHILADELPHIA, PA.

Write it in
Your Order

Wyandotte
Textile Soda

given a trial in the Scouring, Fulling and Finishing of both raw stock and finished cloth will produce results that will astonish you. And as a soap builder, an acid neutralizer and color setter and brightener, it has no peer.

These claims not only appear to be, but are unusual, and Wyandotte Textile Soda is an unusual soda. The desirable qualities preserved to the Wool and its products by the use of this Soda impart a certain distinction or superiority as highly prized by the trade.

Order from your supply house.

None Genuine except with a card bearing this Trade Mark

In Every Package.

The J. B. Ford Co.,
SOLE MANUFACTURERS,
Wyandotte, Mich.

THIS SODA WAS AWARDED THE HIGHEST PRIZE — GOLD MEDAL — AT BOTH THE ST. LOUIS AND PORTLAND EXPOSITIONS.

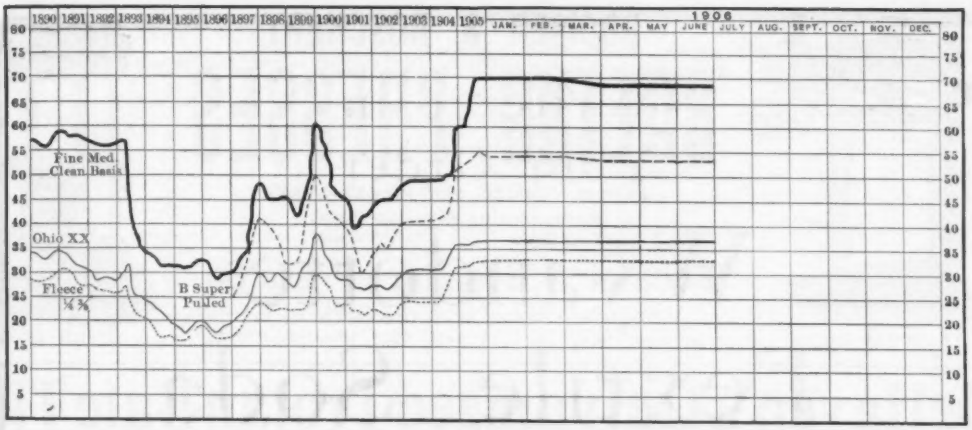
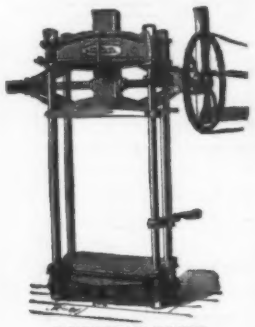


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Wool Market.

With the new clip sold to dealers at high prices the manufacturer is placed in a difficult position by reason of the uncertainty as to the course of the goods market. One thing, however, he can count upon and that is a high level of prices for raw material. With this practically certain there has been a special effort made to diversify the product to include fabrics containing a large proportion of cotton and wool substitutes. If the buyer of goods will not pay the price for all wool goods these cheaper grades will be available as alternatives. Manufacturers have been sampling and testing freely preparatory to buying in large lots as soon as sales of goods warrant it. It is reported that the mills are well stocked with wool and that there will be no scramble to secure supplies this season. The markets abroad continue strong. Most of the foreign wool now coming in is for delivery direct to manufacturers, and as a consequence there is a great scarcity of imported wool for immediate supply on new orders. It becomes evident as the season progresses that prices in the domestic markets are to be well maintained. The growth and prosperity of the country, the brisk demand for labor in all sections, the slow development of the domestic wool supply form a combination that makes any material decline in prices practically impossible. Other factors work against any further advance, and the most experienced observers believe that present conditions will, therefore, continue unchanged for some time to come.

THE ONLY METHOD THAT WILL MAKE WOOL NONSHRINKABLE.
ABSOLUTELY NONSHRINKABLE
FORWOOL
Registered.
ABSOLUTELY NONSHRINKABLE
FOR INFORMATION CHAS. H. HEYER, REAL ESTATE BLDG., PHILADELPHIA, PA.



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BOOMER & BOSCHERT

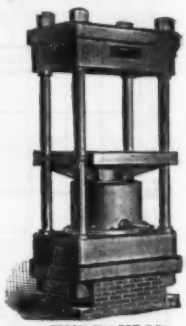
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

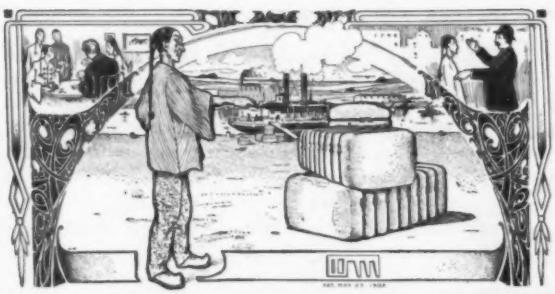
Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
Southern Agent, A. H. WASHBURN, Charlotte, N. C.



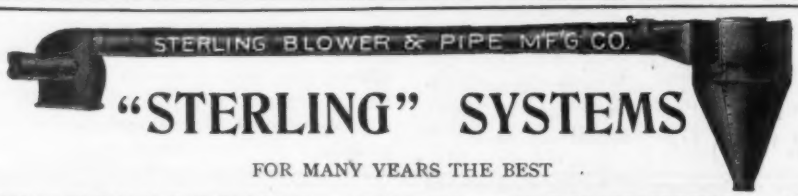
HYDRAULIC.

DeHaven's Galvanized Trojan Bale Tie



The heathen Chinese is peculiar but he "buckles" on to a good thing. The U. S. Consular report under date of January 23, 1906, referring to the baling of cotton goods for export to China, states: — "There is a lightweight metal band used by some American mills which is better than any in use..... The metal does not rust by contact with water or dampness as do ordinary iron straps" This refers to our Galvanized Trojan Bale Tie with patent buckle. Send for samples and be convinced.

DeHaven Manufacturing Company,
50 Columbia Heights, Brooklyn, N. Y.



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FOR MANY YEARS THE BEST

DUST COLLECTING, WOOL CONVEYING, ETC.

STERLING BLOWER & PIPE MFG. CO.

Write for "1906" Catalog.

HARTFORD, CONN., 1027 Huyshope Ave. New York Office, 136 Liberty St.

For **25 YEARS** We have held OUR REPUTATION as Progressive Manufacturers. Do not forget this when ordering GAGES.

ORIGINAL SINGLE BELL CHIME WHISTLE
Harmonious
Far Reaching
Pleasing.

A Truthful Gage is the only GOOD GAGE.

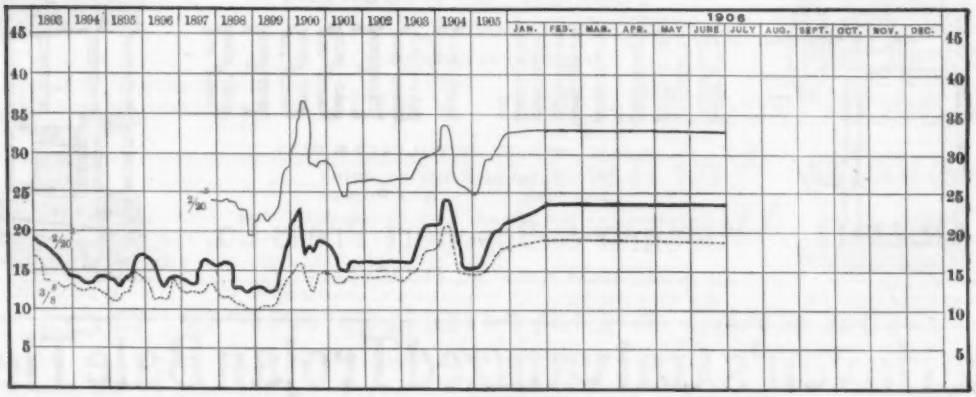
This Company manufactures, besides the above a large variety of articles used in connection with steam engines and boilers, all of which are standard quality, and may be relied upon. *Send for Catalogue.*

CROSBY STEAM GAGE & VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works:
BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

Demand and prices for yarn continue strong regardless of the decline in raw material. The yarn market is in a large measure independent of the cotton market and controlled by the capacity of the spinning mills and the requirements of weavers and knitters. If cotton had not declined or had advanced it would have been easy for the spinners to secure an advance. As it is any further decline in raw cotton would doubtless be followed by a weakening of the yarn market. The situation thus hinges on the price of the raw material and all the factors by which that price is influenced. The demand for cotton yarn for men's wear has grown to large proportions in recent years and this has helped the spinners materially. Buyers of yarn are encouraged by the weakness of cotton to redouble their efforts to obtain concession. Egyptian yarn is in good demand with no indication of weakness.

We quote as follows:

We quote as follows:

Eastern Cops.

6s	18¾
8s	19¼
10s	19¾
14s	20¾
16s	21¼
18s	21¾
20s	22¼
22s	22¾
24s	23¼
26s	23¾
30s	24¾
34s	25½
36s	26½
40s	28

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	21½
14s	22
18s	23
20s	24
24s	25
26s	26
30s	29
36s	33
40s	36
45s	39
50s	43
55s	45
60s	47

Eastern Two-Ply Warps, Carded Peeler.

2/30s	29
2/36s	33
2/40s	36
2/45s	39
2/50s	43
2/60s	48

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	38
36s	40
40s	42
45s	45
50s	49
55s	52
60s	55
70s	60

Philadelphia Yarn Market.

There has been quite a drop in cotton the past few weeks, but the decline has not been fully reflected in the yarn market, owing to the steady demand for yarns in most all numbers, and to the

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.

The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

fact that spinners are so well supplied with orders that they are not compelled to cut prices to get business.

The demand for fine two ply yarns continues as good as at any time during the season, and on all other lines the yarn business has been very satisfactory.

Prices on most single yarns have declined in sympathy with the drop in cotton. A number of the best spinning mills are sold up for the larger part of their production until the 1st of January. This ought to have the effect of holding prices steady during the summer and fall.

Egyptian cotton remains very high and manufacturers are substituting peeler yarns, whenever possible. Prices today are about as follows:—

Southern frame spun cones:—

7s and coarser	18½
8s and 9s	18½
10s	19
12s	19½
14s	20
16s	21
18s	21½
20s	22
22s	22½
24s	23½
26s	24
30s	25
40s	33
50s	38

Southern high grade mule yarn:—
Cones.

10s	20½
12s	21
14s	21½
16s	22
18s	22½
20s and 22s	23-23½
24s	24

Southern frame yarn, lower grades:—

6s and 8s	18¼
10s	18¾

Eastern cones (high grade quality):—

10s	21
12s	21½
14s	22
16s	22¾
18s	23¼
20s and 22s	23¼-24¼

Skein yarn (mostly Southern):—

4s and 8s soft	18-18½
10s to 12s	19-19½
14s to 20s	20-21½
22s	21½
14/2	20½
16/2	21
20/2	23
30/2	27½
40/2	35½
16/3 slack	21
12/3 slack	20
8/3 carpet	18½

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
AND COTTON CLOTHS.
122-124 Chestnut Street, PHILADELPHIA, PA.
73 Leonard Street, NEW YORK.
Brown Building, 183 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
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206 Chestnut Street, PHILADELPHIA.
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Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

H. D. Salkeld & Bro.
COMMISSION MERCHANTS
With FRED'K VIETOR & ACHELIS
COTTON YARNS
66-72 LEONARD STREET - - NEW YORK

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & Co.
COTTON YARNS
MERCERIZED YARNS } ALL NUMBERS FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

LUDWIG LITTAUER,
Successor to MOELLER & LITTAUER.
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.
HIGH GRADE HOSIERY YARN
White and Colors. All Numbers.
Sewing Twines on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard St New York.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.

Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters
Double and Twist Yarns for Woolen Trade.

PAWTUCKET, R. I.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. **WARPS**

CELEBRATED BRAND PYRAMID **LACINGS**

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

115 Franklin Street, NEW YORK.

C. MOORE & CO.,

Manufacturers of

TWINES, THREADS AND YARNS,

Jacquard Harness Twines of all kind on hand and made to order.

S.W. Cor. Fifth and Market Sts., Phila.

The "Simplex" Tables

Comprising

Comparative Yarn Tables, showing the equivalent sizes of different systems of Numbering Yarn and Different Standards.

Reed Tables

Weight of Yarn per Yard of Cloth Tables.

Knitting Machine Gauges. Yarn Sizes for Knitting Machines. Sizes for Underwear and Hosiery.

Breaking Strength Table of American Cotton Warp Yarns.

Compiled by the

TEXTILE WORLD RECORD

Price 50 Cents

LORD & NAGLE CO., Publishers

299 Devonshire Street, Boston, Mass.

Indian Orchard Company
Cotton Warps and Yarns.
In Gray and all Colors, Single or two or more Ply, and Cable Cord
Novelty Yarns.
in Various Patterns, Colors and Twists.
Carded and Colored Cotton.
For Mixing with wool, Machined or in Roving
Indian Orchard, Mass

8/3 slack	18½
9/4 slack	18½
Warps (Southern):—	
10s to 12s	19-19½
14s	20
16s	20½
20s to 22s	21-22
26s	23
14/2	21
16/2	21½-22
20/2	23
24/2	24
30/2	27½
40/2	36
Mixed colored yarns (mock twist, half colors):—	
6s to 10s	19-19½
12s to 14s	20½-21½
16s to 18s	22-23

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners continue busy on orders from dress goods weavers and also from certain lines of men's wear. Some spinners have made concessions over the highest prices quoted; some state that wool will not warrant lower prices and insist that at the prices sold last January, there is no profit and so are selling cautiously as it is impossible to know where the wool is coming from to meet prices quoted. Certain it is that if the light weight season opens up well and weavers secure good orders that prices for yarn will not be any lower. Spinners should secure some good orders for yarn, as buyers, at least those in the men's wear end of the business, profiting by their experience of the heavy weight season, will delay placing orders until after the season has opened. The spinners do not appear to be in any hurry to sell yarn and are not contracting far ahead. It may be that many are waiting to insist on prices in conformity with the price of wool.

Serge yarn and single yarn for filling will be in good demand as serges and mercerized worsted cloth are styles that will have the call the coming light weight season. In single yarn the size to be used will be 24s; in fancy worsted the sizes will be 2/32s and 2/36s in 3/8 blood quality.

Weavers undoubtedly will be obliged to advance prices, but not to the extent the heavy weight prices were advanced during the last heavy weight season. Everyone knows that the light weight season in men's wear is always the best season of the year and with seasonable weather there should be no lacking of orders for cloth, which will necessitate the placing of large orders for yarn.

Of course much cotton is going to be used, but it is also stated that there is going to be a better demand for worsted cloth. Many of the weavers are to continue their old lines of mercerized worsted cloth as these lines were the popular sellers

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
426 and 428 Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED.·.YARN.·.SPECIALTIES

You Save Enough Insurance to Pay for the Equipment.
So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.
Pettes & Randall Co., 150 Nassau St., New York

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
65-67 WORTH STREET, NEW YORK

Ramie Tops, Ramie Noils, Silk Tops, Silk Noils, Luxonne Silk, Sliver, Rovings, Yarns.

FRANK A. TIERNEY,
TOPS, NOILS, ROVINGS, YARNS.
GARNETTED STOCKS.

Ramie Yarns, Silk Yarns, Silk Noil Yarns,

Wool Exchange Building, 260 West Broadway, New York, N. Y.
WOOL, SILK, MOHAIR, CAMEL HAIR, RAMIE.
PREPARED TUSSAH SILK FOR WOOLEN MANUFACTURERS, READY FOR IMMEDIATE USE ON REGULAR WOOLEN MACHINERY.
SPECIAL TEXTILE FIBRES AND NOVELTIES.

Pocasset Worsted Company,

WORSTED YARNS

IN THE GRAY.

Mills at Thornton, R. I.

Office 100 Boylston St., Boston, Mass.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

EDDY & STREET,

Cotton, Woolen

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,

Highland Worsted Mills,

Loridan Worsted Co.

300 Chestnut Street, PHILADELPHIA. PA.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

YARNS Solis, Boston.

77 SUMMER STREET.

ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH CO.,

Manufacturers of

Diamond Stay Bindings TRADE MARK

Tapes, Webbing and Bindings.

COTTMAN and G STS., PHILADELPHIA

Ryer's Station, P. & R. R. R.

Bell Telephone, 203 Cheltenham.

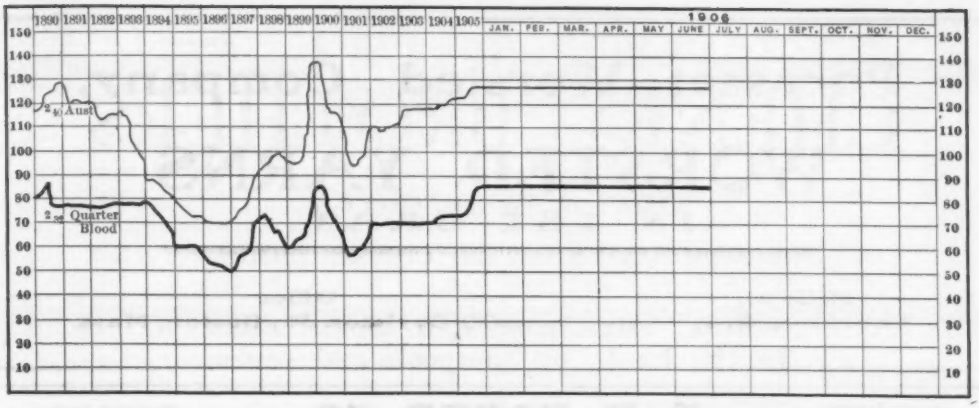


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

last year and the old lines together with newcomers will boom this class of cloth for all it is worth and are preparing to make it in large quantities.

The heavy weight season has been a very hard one for the men's wear weavers. The mills have run fairly well but could have taken on more orders. The cotton worsteds were purchased in large amounts. Towards the latter end of the season a better demand for worsted cloth was experienced as the buyers kept out of the market as long as possible. Some mills sold out yarn ordered early in the season and as far along as January and at this later period when there came a demand for the better class of cloth bought yarn back again, some claim at a lower price than that at which they sold out.

Weavers state that they do not intend to contract far ahead and will not buy largely until the season is well opened up. They figure that yarn is as high as it is going to be and therefore there is no inducement to place large orders far ahead before orders have been secured for cloth. Up to the present writing the larger mills have bought no supplies of worsted wools. If later these same mills require yarn the demand will materially strengthen the wool market and as a matter of fact the price of yarn will be governed entirely by these conditions.

The French spinners are securing good orders from the hosiery trade. Prices continue very firm and much wool and cotton spun worsted yarn is being used to cheapen the cost of hosiery. Much yarn is being sold for filling of men's wear. The combers are busy and prices are being firmly maintained. The demand for yarn is quiet at present, but the outlook for the future is good and a great business is looked for during the coming six months.

We quote as follows:

2/4s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	1.00-1.02 1/2
2/32s 1/4 Blood	87 1/2
2/20s 1/4 Blood	82-87

Woolen Yarn.

Spinners continue busy and have more orders than they can fill and give prompt deliveries, and this notwithstanding that the light weight men's wear business is about to start up. The demand for woolens will largely increase during the coming light weight season, for although naturally the light weight season is a worsted season, yet the high price of worsted is permitting the weavers of woolens to put on the market imitations of worsted cloth. We know there are several lines of supposedly all worsted that are largely made of a woolen thread with a very hard twist. This enables these mills to use much outside woolen spinning machinery and secure good orders at profit to themselves. The next heavy weight season will see it still further increase with a good demand for overcoatings and when this comes the demand for woolen yarn will be beyond the ability of the spinners to supply. The run out of the heavy weights will not come about until August and the new lines already secured will replace these customers.

Underwear knitters are employing much outside machinery and as the light weight underwear season develops the demand for machinery space will be still greater. The buyers are all trying to

CHENEY BROTHERS

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

Trams, Organzine and Spun Silks in the hank, or on spools and cones.

Silks for electrical uses, insulation and special purposes made to order.

Knitting Silks, Ribbons and Piece Goods for Trimming Knit Goods.

Pure Dye and Fast Colors Warranted

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

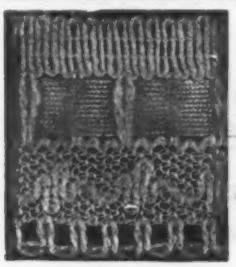
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 12 to 32s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

FOR EFFICIENCY NON-FLUID OILS FOR ECONOMY

TRADE MARK REGISTERED IN UNITED STATES PATENT OFFICE

Lubricants that fill the gap between fluid oils and greases.
Non-Fluid oils have all the advantages of oils; all the economy, cleanliness and reliability of greases, but not one of the disadvantages of either.

There is no waste in applying Non-Fluid Oils; every bit that is fed is actually consumed in lubrication.
There is no increased drag on machinery as with greases;
Try Non-Fluid Oils at our expense. Samples and valuable booklet free.

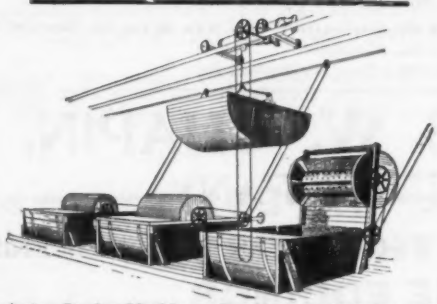
NEW YORK & NEW JERSEY LUBRICANT COMPANY,
Dep't H. 14-16 Church Street, New York, City.

get lower prices quoted on yarn, but spinners are unable to meet this demand as wool is holding so high that concessions are impossible. Some mills that have never used anything but the better class of wool, in order to meet the market demand for prices, are using the better grades of garnetted wastes.

The mills are without large stocks of yarn or wool and as the season progresses there must be some large buying. Much waste must be purchased. All are trying to get something as good as wool for a price less than wool. Knitters who must pay 80 and 85 cents for fine Nevada and Oregon wools are buying garnetted waste for 70 cts. per pound, putting it into their goods and getting results that enable them to secure profitable business.

The underwear trade is in a good healthy condition and a good business is to be expected during the next six months. The spinners are looking forward confidently to a good run and are insisting on higher prices in many cases for the use of their machinery.

Smith, Drum & Co.
2503-9 CORAL ST., PHILA., PA.
Dyeing Machinery
FOR WARPS AND PIECE GOODS
Bleaching Machines



Circulating Dyeing Machines. For Hosiery, Underwear, Raw Stock and Rags. Singeing Machines for Hosiery. Mercerizing Machines.

G. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.
Boston Office, 200 Summer St.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Official American Textile Directory.

The TEXTILE WORLD RECORD, which for years has compiled and published the ANNUAL OFFICIAL DIRECTORY OF THE TEXTILE INDUSTRIES, has bought the AMERICAN TEXTILE DIRECTORY, and will merge the two Directories, retaining the special features of each, and with the combined subscription and sales list of both.

It will be published in two editions, viz.: the Office Edition, price, $3.00, and the Travelers' Edition, smaller in size, with thin paper and flexible binding, price, $2.00. The combination price for the TEXTILE WORLD RECORD and DIRECTORY will be $3.00 per year with the Travelers' Edition, and $4.00 per year with the Office Edition.

Those customers who have already placed their orders for either publication may b assured that the combined Directory, known as the OFFICIAL AMERICAN TEXTILE DIRECTORY, will be better than they stipulated for.

The 1906 Edition will be published in July as usual and will be delivered promptly to Subscribers and those whose orders are in hand.

CONTENTS.

THE MAP FEATURE was originated by the Textile World in 1894, and is copyrighted. There are 19 of these textile maps, which show only the cities and towns where there are textile establishments.

A COMPLETE DIRECTORY OF MILLS including Cotton, Woolen, Knitting, Silk, Flax and Jute Mills of the United States, Canada and Mexico, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments.

Full information is given about each mill in almost every instance, viz.: the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct, and in many instances the name of the man is given who buys the raw material and supplies. In this section of the Directory, all the mills in one place are arranged under the head of that town, but so designated that the kind of a mill is determined at a glance by bold-face letters, so that a person looking, for instance, only for woolen mills, can pick them out at a glance. This system of arrangement is conceded to be the most convenient of any, as it groups all the mills in one town together and is self-indexing, while at the same time those interested in a particular class of mills, such as cotton, silk or knit, can find them as easily as if they were classified separately.

AN ALPHABETICAL INDEX to the textile establishments in the United States.

MILLS WITH WORSTED MACHINERY. A separate list is compiled of mills with worsted machinery for the convenience of those dealing exclusively with that branch. This is a feature unique in this Directory.

THE TEXTILE MILLS IN MEXICO. This feature of the American Textile Directory is continued and brought up to date by the latest information.

THE YARN TRADE INDEX. In this department are classified lists of manufacturers of different kinds of yarn who spin for the market. It gives the size of yarn spun and the form in which the yarn is put up, together with the selling agents of the mills, or, if sell direct.

COMMISSION AND ORDER SECTION. In this department are classified lists of establishments doing dyeing, bleaching, printing, finishing, and mercerizing on order, sub-divided according to the class of work done.

RAW MATERIAL SECTION. In this department are complete lists of dealers and brokers in wool, cotton, shoddy and extracts, and wholesale rag dealers.

SELLING AGENTS AND DRY GOODS COMMISSION HOUSES in the principal cities of the United States, giving the character of goods handled.

MANUFACTURING CLOTHIERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

SUIT AND CLOAK MANUFACTURERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

MACHINERY AND SUPPLY SECTION. This contains a carefully classified index of over seven hundred builders of textile machinery and dealers in mill supplies.

LORD & NAGLE COMPANY,

PUBLICATION OFFICE, . . . 299 DEVONSHIRE STREET, BOSTON

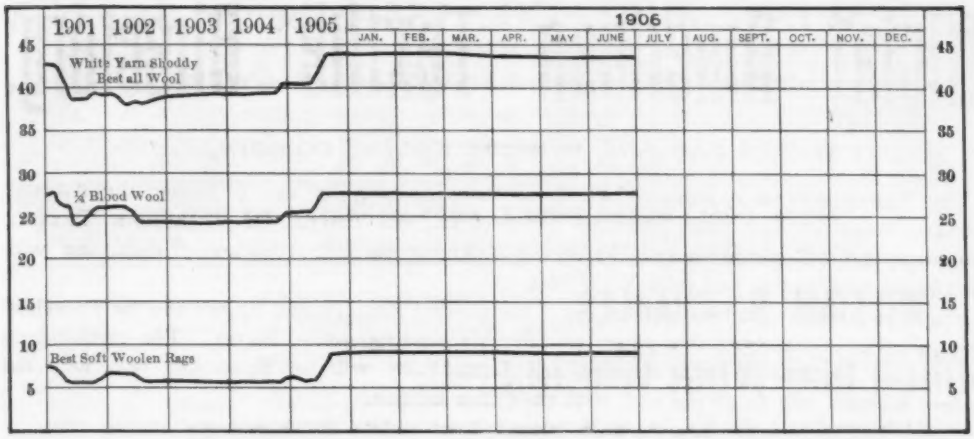


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Rag and Shoddy Market.

There has been no revival in these markets. There is but a sluggish demand, which is supplied freely except when strictly high grade stock is required. There is much complaint of the difficulty of getting goods rags. Prices are well maintained despite the dullness. This is especially true of the better grades. There is not much expectation of a revival of trade. The light weight goods now being made by the mills contain very little shoddy, and it is too early to discuss the prospects for the next heavy weight season.

Wool waste is in fair demand, the supply being restricted. More business would be done if the material was available. Cotton waste is weak in sympathy with the raw cotton market. We quote:

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30

Merino.

Fine light, all wool	24-27
Medium light, all wool	15-17
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

WOOLEN RAGS.

Fine merchant tailors	10-11
Choice light colors	13-14
Browns	12-13
Blacks	9-10
Fine blues, plain	9-10
Fine dark	12-13
Medium dark	7-8

Worsteds.

Blue	15-17
Black	21-22

Serges.

New black	16-18
New blue	14-16

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	9-9½
Old white flannels	23-24
White flannels, No. 2	11-12
Old red flannels	13½-14
Light blue flannels	7½-8½
Old blue flannels	9½-10
Old plaids	8-8½
White stockings	24-25
White hood stock	24-25
Clear hoods	9-10
Blue stockings	8½-9½
Fancy stockings, No. 1	9½-11
Gray stockings	10½-11
Black stockings	11-12
Knit stock comforters	7-8
Red knit	13½-14
Light gray knit	10½-11
New light fancies	14-15
New fancies	11-12

Merinos.

Light, fine	16-17
Light, coarse	7¼-7½
Fine, dark	14½-15½
Coarse, dark	6½-6¾

L. J. WING MFG. CO., 136 Liberty St., N. Y.,

Manufacturers of

WING'S DISC FANS, EXHAUSTERS, BLOWERS,

High Speed Steam Engines, Electric Motors, Acetylene Generators, Laundry Irons, etc. Also

WING'S FAN AND TURBINE ENGINE COMBINATION

For Forced Draft for Boilers, Humidifying, Removing of Steam, Vapors, etc. Something New and Valuable.

SAVES COAL, BURNS SMOKE, ADDS CAPACITY TO BOILERS.

WRITE FOR PARTICULARS.

WILLIAM B. CHARLES,

Cotton and Wool Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

Boston Office: 200 Summer Street.

SHODDY

WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty.

FLOCKS

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Specialty.

New York Office:
140 DUANE STREET. **RIVERDALE, NORTHBRIDGE, MASS.**

HEGEMAN SEAMLESS BOBBIN COVER.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

FRANK E. KOLB,
MILL SUPPLIES
Amsterdam, N. Y.
SOLE AGENT FOR
Adams' Patented Latch Needles

Blue	11-12
Blue—seamed	
Black—seamed	15-16
New black	18-20
Small	4¼-4¾
Bunting	7-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10

COTTON WASTE.

No. 1 Spinners	10-10½
No. 1 Machine	4½-4¾
No. 2 Machine	4¼-4½
Machine Cop	8¼-8¾
No. 1 Cop	8½-9
No. 1 Card	8-8½
No. 2 Card	7½-8
No. 1 Oily Card	4½-5
No. 2 Oily Card	3½-4
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	6-6½
No. 2 Linters	5¼-5¾
White Clips	4½-5
Colored Clips	1½-2¼

Alabama, Birmingham. It is reported that the lot, site and plant of the Birmingham Cotton Mills, long idle, has been purchased by Ike Adler. It is not known whether the plant is to be restarted or has been purchased for investment only.

Alabama, Talladega. A controlling interest in the Chinnabee Cotton Mills has been purchased by John H. Hicks, of the Highland City Mills. Mr. Hicks has been elected president of the Chinnabee plant.

*Alabama, Tuskegee, We have been advised by C. W. Hare that he has recently acquired a plantation of over fifteen hundred acres of land within and near the corporate limits of the town, and has offered to give ten acres to any company that would build a mill, believing that there are superior opportunities for a medium sized plant. He does not know just how much stock the citizens would subscribe, but thinks that a goodly support is assured.

Connecticut, Mystic. Arrangements are being made by the Mystic Woolen Co. to erect a large storehouse for the finished goods.

FIRE, LIGHTNING, WINDSTORM.

The HOME INSURANCE COMPANY NEW YORK

Organized 1853. MAIN OFFICES, 56 CEDAR ST.

Cash Capital, $3,000,000.

HOME losses at San Francisco cannot exceed $2,000,000. Note amount of net surplus.

HOME Policy-holders everywhere have protection, which is sure, notwithstanding conflagrations anywhere.

ASSETS January 1st, 1906	$21,239,052
LIABILITIES (Including Capital)	12,518,551
NET SURPLUS OVER ALL LIABILITIES	8,720,501
Surplus as regards Policy-holders	11,720,501
Losses Paid Since Organization Over	99,000,000

IS prepared to entertain liberal lines on Sprinkler-Equipped and Modern Improved risks generally, having a special department for the consideration of such business.

ELBRIDGE G. SNOW, President.

EMANUEL H. A. CORREA, Vice-Pres. AREUNAH M. BURTIS, Secretary.
FREDERIC C. BUSWELL, Vice-Pres. CHARLES L. TYNER, Secretary.
CLARENCE A. LUDLUM, Ass't Sec'y. HENRY J. FERRIS, Ass't Secretary.

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.00-2.50
Citric, domestic	43-43½
Oxalic	6¼-6½
Sulphuric, 60 deg., 100 lbs.	1.00-1.20
Muriatic, 18 deg.	1.15-1.75
Tartaric crystals	28-28¼

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.85
ground	1.85-1.95
powdered	2.75-2.80
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6⅛
Borax, bbls.	7½-8½
Brimstone, crude, foreign ton	22.12½-22.62½
Copperas	52½-65
Cream tartar, crystals	22½-22¾
Fuller's earth, lump, 100 lbs.	
powdered	80-85
Glauber's salt	40-45
Potash, chlorate, crystals	8½-9¼
powdered	8¾-9½
carbonate	3½-4
Soda ash, carbonate, 48 per cent.	1.20-1.30
high test	1.00-1.25
Soda, bicarbonate, English	
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	70
Sulphate, alumina	1-1¾
Vitriol, blue	6-6¼

Dyestuffs.

Acetate of soda	4¼-4½
Acid, picric, best crystals	22-27
tannic, commercial	32-35
Albumen, egg	52-65
blood	20-27
Alizarine, red	15½-16½
Aniline, oil	9½
salt crystals	8½-8¾
Antimony salt, 65 per cent.	24½
Bichloride of tin, 50 per cent.	11¾
45 per cent.	10½-11¼
Bichromate of potash, American	8¼-8½
Bichromate of soda	6¼-6½
Bisulphate of soda	80-1⅜
Cutch, mat	4-5
boxes	6-7
Dextrine, imported potato	6-7
corn	2.75-2.90
Divi-divi, ton	27.00-35.00
Flavine	23-40
Fustic, stick, ton	17.00-20.00
young root	45.00
Gambier	3.92-4.125
Hypo. of soda, Am. bbls. cwt.	1.40-1.50
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's	47½-60
Gautemala	35-70
Manila	43-45

Make Your Power Productive.

Cut out the losses due to slipping belts, the friction caused by tight belts—use every bit of power to turn the pulleys. Run your belts slack without slipping by using

Warren's Liquid Pulley Cover.

Eight years in use in textile mills increasing output from 10 to 25 per cent with no added expense for operation. Write for names of mills in your line who are using Warren's Pulley Cover. Put up in packages of 40 sq. ft. at 12½ per sq. ft. ($5.00) and 125 sq. ft. at less than 10c per sq. ft. ($12.00), with brushes and full instructions for use.

The Warren Co., Mfrs., 192 Orleans St., Chicago, Ill.

Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.50-21.00
roots	15.50-16.50
Madder, Dutch	12-14
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	23-25
Persian berries	7
Phosphate of soda	1.80-2
Prussiate of potash, yellow	15-15⅜
Quercitron, ton	20.00-22.00
Starch, corn, pearl, bbls.	2.20
corn, pearl, bags	2.05
potato	3½-3¾
rice	6½-7½
wheat	4¾-5¾
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	49.00
Sicily, No. 2, ton	47.00
Tapioca flour	2½-3½
Tin crystals	24½-28
Tumeric, Madras	5-5⅛
Zinc dust	5½-5⅝

L. H. A. SCHWARTZ & CO.

141 MILK STREET, BOSTON

IMPORTERS AND EXPORTERS OF

Cotton of Every Description

SOLE AGENTS FOR

R. & O. Lindemann's Egyptian Cotton

TEXTILE MACHINERY

The Latest and most successful Cross Spool Dyeing and Bleaching Machine for Cones and Parallel Tubes, built by

ERCKENS & BRIX, GERMANY

MANY IN OPERATION.

ADVANTAGES:

Most uniform bleaching, and Dyeing all through the bobbins.

Good for all colors, also fast sulphur black.

All deformation of the bobbins is avoided;

Consequently good running off of the bobbins;

Simple and accurate sampling of bobbins; very little attention required.

Little Dye-liquor required; little power for driving required.

Large production; low price.

Colors requiring several baths can be dyed without bobbins being removed.

No Dye-liquor lost.

NIEDERLAHNSTEIN AUTOMATIC HANK MERCERIZING MACHINE.
SEELEMANN'S PATENT CURVED WIRE FOR NAPPING MACHINES.

FIRTH & FOSTER CO.

Dyers and Finishers

York, Emerald and Adams Sts., Philadelphia, Pa.

New York Office, Silk Exchange Bldg., Cor. Broadway and Broome Sts.

Dyeing and Finishing of Piece Goods Exclusively, such as Wool Armures, Prunellas, Satins and Henriettas, Panamas, Poplins, Serges and Cheviots. Mohairs, Bradford Finish, in Fancy and Solid Colorings. Also Suitings and Cloakings.
Specialty in the Treating of Silk and Wool Fabrics, such as Eoliennes, Crepes and Henriettas and all high class wool tissues like Batiste, Voiles and Foules. Also, Cotton and Wool Goods, Mohair Linings and Lastings.

SPECIAL ATTENTION IS GIVEN TO THE REDYEING OF ABOVE

RICHARDSON BROTHERS

542 PEARL STREET, NEW YORK

PAPER AND TWINE MERCHANTS

FOR FINISHERS OF TEXTILE FABRICS

"ROYAL" PRESS PAPERS

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HOME BLEACH and DYE WORKS, Inc.,

DYERS AND BLEACHERS OF COTTON YARNS
Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day.
Office and Works, Pawtucket, R. I.

Pawtucket Dyeing and Bleaching Co.

Bleachers and Dyers of COTTON YARNS and STOCKINET

Office with Blodgett & Orswell Co., Manufacturers of Glazed Yarns.

232 Front St., Pawtucket, R. I.

THE PEERLESS COMPANY,

Dyers of Skein Silk
FOR ALL TEXTILE PURPOSES

Willard and Jasper Sts., Philadelphia.

Pure Dye and Weighted. Bright and Souple.
Dyers of Peerless Black on Artificial Silk.

Thomas Hulme. Edward A. Schneider

THE FAIRHILL BLEACHERY

Bleachers of Cotton Goods
Yarns, Tapes, Webbing and Piece Goods

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MARYLAND BLEACH AND DYE WORKS,

BALTIMORE, MD.

BLEACHING, DYEING AND MERCERIZING
of all grades of Cotton Yarn.

GUARANTEED FAST COLORS.

Direct, Sulphur and Oxidized Black, Fast and Stainless Colors on Merino Yarn. Fast Milling and Alizarine Colors on Wool. TUBING—Universal and Foster—CONING.

Prompt and Careful Attention Given to All Orders.

NICETOWN MFG. CO.,

4303-09 No. 18th Street, Philadelphia.

MILL SOAPS

OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS.
ALL GOODS GUARANTEED.

ARTHUR FAWELL

Woolen and Worsted

YARN DYER

Nos. 110 and 112 Turner St., Phila.

BUY YARNS OF

LUZERN COTTON YARN CO.,

WILKES BARRE, PA.

SUPERIOR

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Duxbury's English Calender Roll Papers

FOR EMBOSSING AND OTHER CALENDERS.

CHAS. A. JOHNSON & CO. Sole Agents for America

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The WM. H. LORIMER'S SONS CO.,

Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

MERCERIZERS AND DYERS.

New York Office:
Room 911 New York Life Building,
346 Broadway.

Ontario and Lawrence Sts.,
PHILADELPHIA, PA.

PROVIDENCE MILLS COMPANY,

55th AND GIRARD AVE., PHILADELPHIA, PA.

BLEACHERS AND FINISHERS

Correspondence Solicited.

OF ALL CLASSES OF LINEN GOODS.
Toweling and Damasks a Specialty.

Telephone Connection.

JOHN F. DAVIDSON, Orianna Bleach Works.

BLEACHERS

Of Turkish Towels, Cotton Yarns, Underwear and Tapes.

Turkish Towels Made Up to Suit the Trade and Shipped to any Point.

2558-2564 North 3d Street, 2557-2563 Orianna Street, PHILADELPHIA.
Office, 2557 Orianna Street. Correspondence Solicited.

R. GREENWOOD & BAULT,

DYERS, BLEACHERS AND MERCERIZERS

OF COTTON WARPS AND SKEIN YARNS.

Globe Bleach and Dye Works,
Oxford and Worth Sts., Frankford, Pa.

140 Chestnut Street, PHILADELPHIA.

We are Dyers of all kinds of YARNS AND Cotton Warps

We are sure we can give you better work and better service that you can get elsewhere. A trial will convince.

T. BROPHY'S SONS, Jasper St., above Clearfield St., - PHILADELPHIA, PA.

WE DO BLEACHING and DYEING

ESPECIALLY FOR THE KNIT GOODS TRADE

YARNS BLEACHED AND DYED (delivered on cones)
CONE WINDING FOR THE TRADE.

Schuylkill Haven Bleach and Dye Works, SAMUEL ROWLAND, Schuylkill Haven, Pa.

N. B. Bleached Finishing Yarns on Cones for Underwear, always in Stock.

INGRAHAMVILLE DYE WORKS,

Dyers and Bleachers of Cotton Yarns in long or Short Chain Warps and Skein, in FAST COLORS, FOR BLEACHING PURPOSES, Cross Dyeing, Ginghams, Etc.

Also Dyers of Turkey Reds and Indigo Blues for all purposes in either Warp or Skein.

Telephone. PAWTUCKET, R. I.

A. KLIPSTEIN & CO.

Dyestuffs and Chemicals

Fast Colors for Wool and Cotton.
Full Line of Direct Cotton Colors.

THIOPHENOL BLACK T EXTRA and 2 B EXTRA.
PYROGEN BLUE R . . . . .
PYROGEN INDIGO. . . . .

} Direct Sulphur Colors, Faster than Indigo, to light and Washing.

Chrome Fast Blacks, Blues, Browns and Yellows.
Acid Benzyl Blue, Violet Green and Black.

Headquarters for Caustic Potash 90%. Carbonate of Potash. Chlorate of Potash and Soda. Tannic Acid. Bleaching Powder.

122 Pearl Street, .. NEW YORK

BRANCHES

Boston Providence Philadelphia Chicago Hamilton and Montreal, Canada

SOLE AGENTS FOR

The Society of Chemical Industry, Basle, Switzerland.

H. A. Metz & Co.,

122 Hudson Street,
NEW YORK, N. Y.

AGENTS FOR THE UNITED STATES AND CANADA

FOR THE PRODUCTS OF

FARBWERKE VORM. MEISTER, LUCIUS & BRUENING

Aniline Colors **Alizarine Colors**
Chemicals **Indigo M L B**

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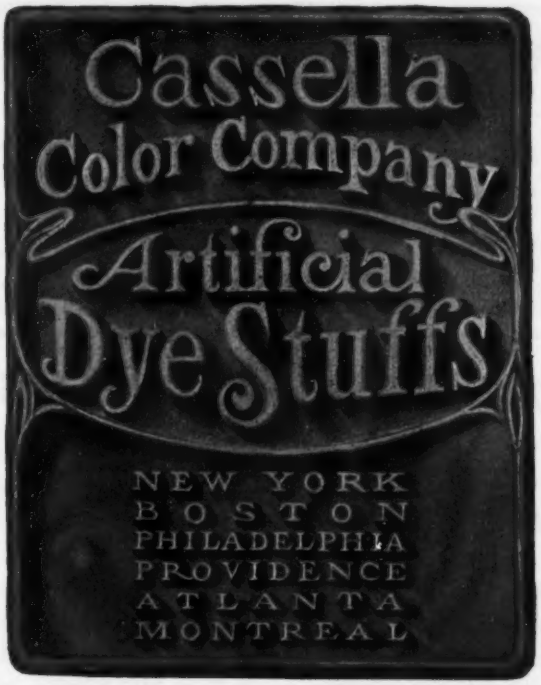

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Where? How? Why? Who?

Where can we get such a machine?
How can we produce this effect?
Is the production of our mill too low?
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Why does this machine run badly, and what can I do to fix it?
How is this problem solved?
How is this fabric made?
Why is this fabric better than that?

Such questions and scores of similar ones are constantly arising, and the Questions and Answers Department undertakes to answer those relating to textile matters, free of charge to the best of its ability, and invites such correspondence from subscribers. Address the Boston office.

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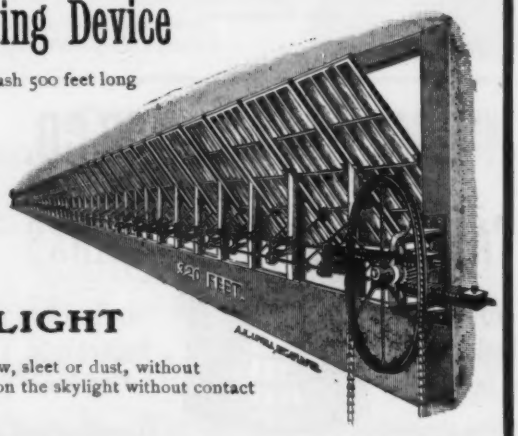

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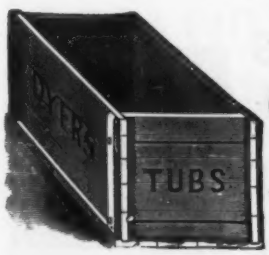

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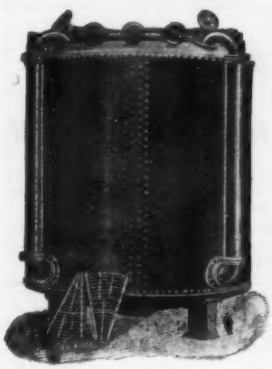

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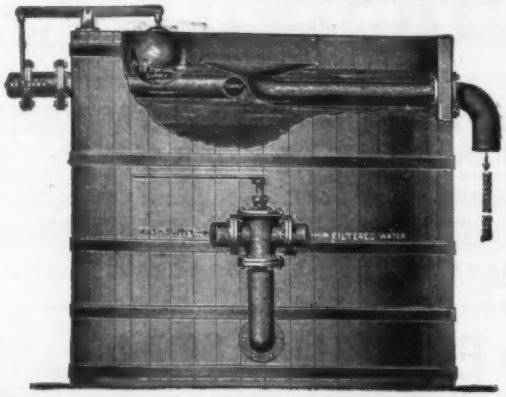

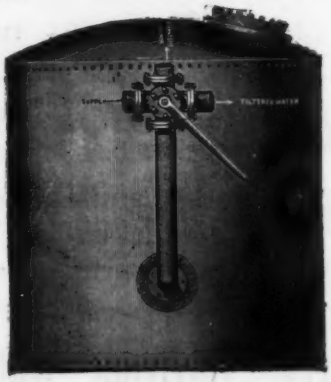

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Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

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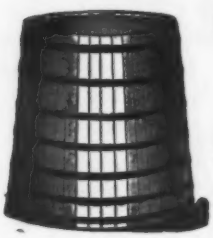

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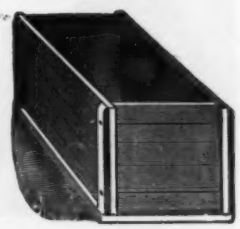
Reservoir Tanks of any Capacity or Shape for Sprinkler Systems and all purposes.



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ON THE

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Builder of Fans, Trucks for Yarn Dryers and Dye Houses.

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Beaumont's Patent Cop Dyeing BLEACHING and SIZING MACHINES

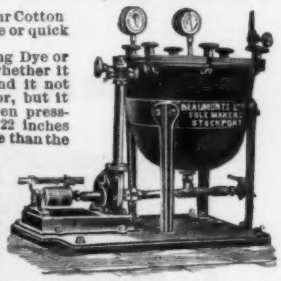
VACUUM MACHINE.

This machine will dye large, hard twisted, twine cops. It will dye or bleach any size of cotton cops. It will scour wool or worsted cops, cheeses and tops. It will scour or dye waste cops. This is a good machine to work in conjunction with the Vacuum and Pressure Machine for washing off, etc.

Vacuum Machines made of Copper and Brass	No. 1 £30	No. 2 £45	No. 3 £85	No. 4 £130
Machines made of Iron	28	38	65	90

This machine will Dye, Bleach, Size and Scour Cotton Hemp, Woolen, etc., in the form of Cop, Cheese or quick traverse bobbins, any thickness or length.

This Machine will circulate absolutely boiling Dye or Size Liquor through every fibre of the yarn, whether it be cop or cheese which is under treatment, and it not only circulates this boiling Dye or Size Liquor, but it forces it into the fibre of the yarn under an even pressure of 10 lbs., and this is more than equal to 22 inches of vacuum; it is **three times** more effective than the ordinary Cop Dyeing Machinery.



This machine will dye evenly and thoroughly through every fibre of the Cops while the spare Cop plate is being refilled with Cops; **in fact it will do this in six minutes.**

Can be depended upon to dye a perfectly even shade all through the yarn, and will dye the most delicate colors. It will dye silk Cops or treat them with any necessary liquor. It will scour or dye wool tops. It will scour or dye large hemp cops and cheeses. It will scour and dye waste cops. We are the Patentees and Sole Makers.

Machines made of Copper and Brass	No. 1. £40	No. 2. £65	No. 3 £115	No. 4. £170
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We supply Two Sets of Skewers and Two Cop Plates with the Machine, whether it is for Weft Cops, Twist Cops or Cheeses.

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in the great middle west. It reaches the Copper Country and the pine and hardwood areas of Northern Michigan, the lead, zinc and iron regions of Wisconsin, the coal fields of Illinois, Iowa and Missouri.

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THE COHNEN
CENTRIFUGAL
Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS
without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING
is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

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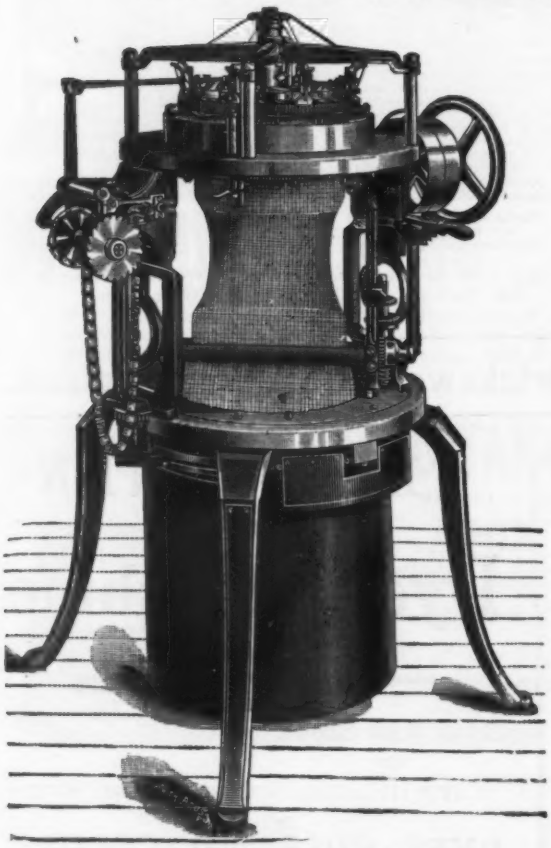
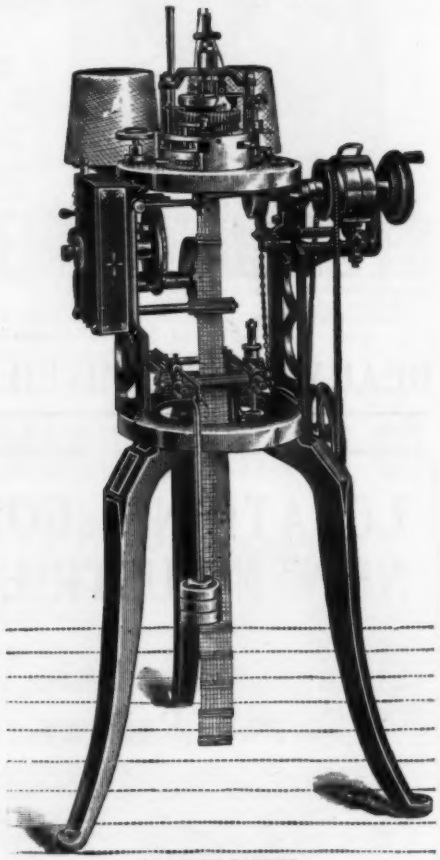
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



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ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

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The most advanced types of straight bar

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for the manufacture of full-fashioned hosiery (cotton, lisle or silk), in all gauges from 14 to 32 needles (spring beard) to the inch, from 12 to 24 sections; for the manufacture of full-fashioned shirts and drawers from 6 to 10 sections with automatic narrowing and widening, built by

SCHUBERT & SALZER

in Cotton-system, of superior quality and construction, with split, striping, single and double lace attachments.

Also machines with latch needles, hand or power motion, for the manufacture of Sweaters, Cardigan Jackets, Ladies' Blouses, Vests, Gloves, Mittens, etc.. built by

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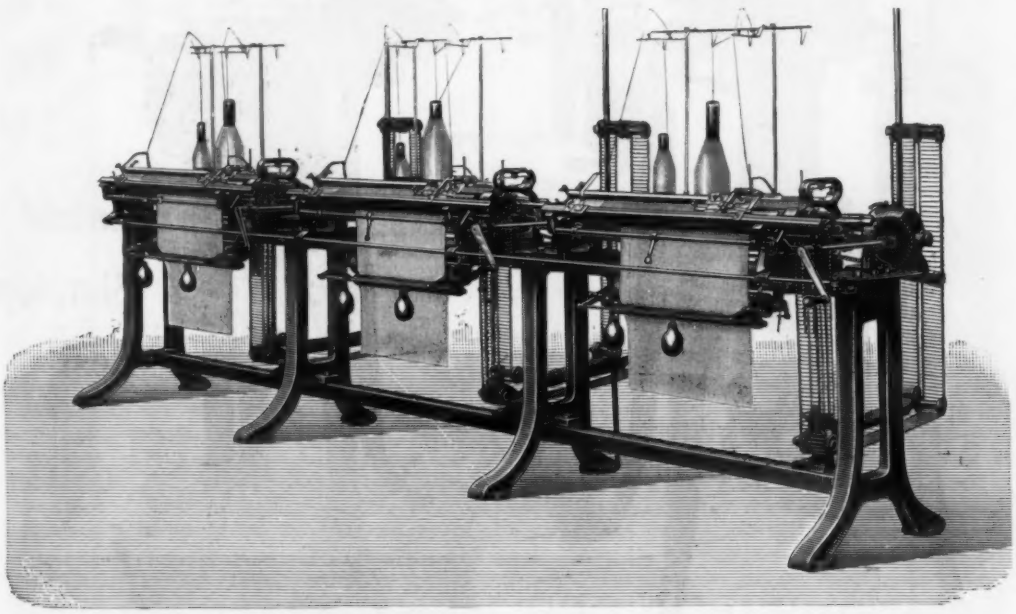

This picture represents one of Seyfert & Donner's full automatic power knitting machines, with chain drive. Each head on stand works independently and can have needle beds of different gauge and width. The machine is fitted with three automatic thread-carriers, two for striping and one for the dividing thread, self-acting lock for welt and royal rib, racking arrangement for whole or half revolution, take-up rollers for endless goods, automatic and electric stop motion.

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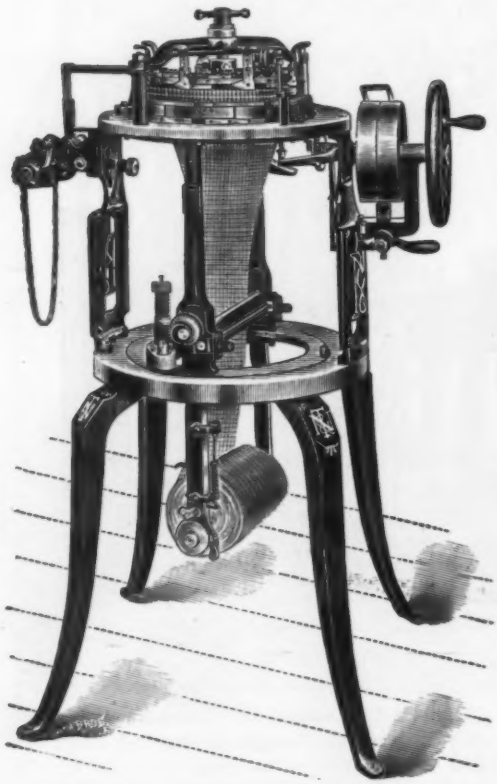
For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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New Full Automatic Knitter.

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A RARE OPPORTUNITY TO BUY.

500 Payne bobbins.
12 Standard "B" 160 Needle Knitters.
1 Bruce band folder and cutter.
1 Weston & Dennis Press, 32x40 in., 15 Hollow Plates.
Lot hosiery stamps, boards, etc.
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6 Hosiery presses (lever).
114 Lamb and Grosser sweater machines.
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1 Rotary fire pump.
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100 feet woven rubber hose, 3 inches dia.
2 paper cutters.
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High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

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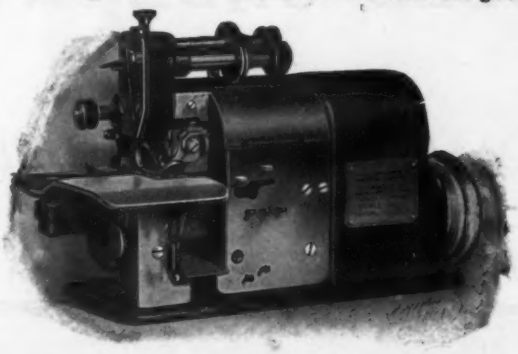
For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



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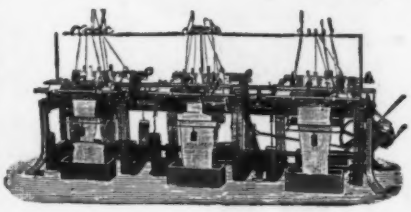

COTTON PATENT HOSIERY MACHINES
For automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear**; high speed, large production. All gauges, and any number of sections, from 2 to 24.

FRENCH FRAMES
C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, Special à-jour** (open work) **Fabrics, etc.**

RASHEL MACHINES
For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc.,** in silk, wool, cotton

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Exclusive Agency for the Famous

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LOOPERS Double thread Lock stitch, self-cutting and cleaning attachment. Reliable money saver.

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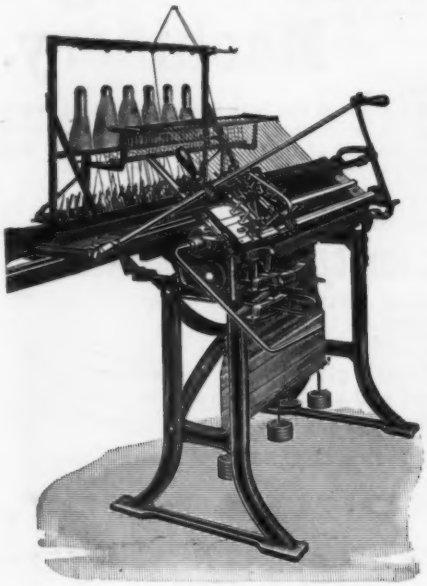

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Specialty: Jacquard Machines

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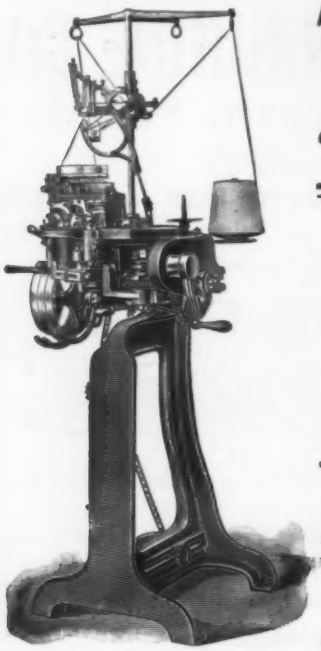

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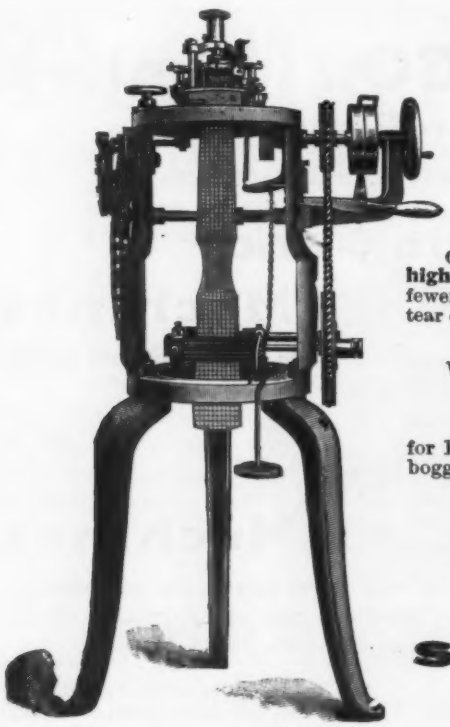

High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

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Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

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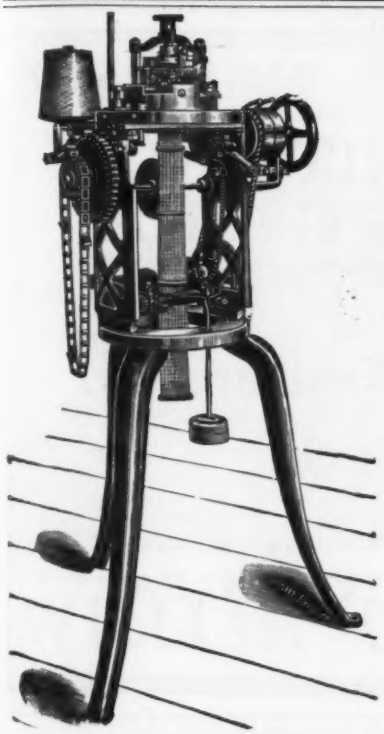

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For HOSIERY and UNDERWEAR.

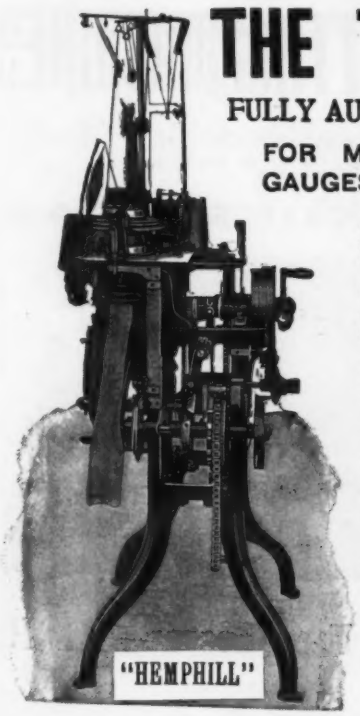
Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber with** Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY



One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

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Knitting - Machine and Needle Co.,

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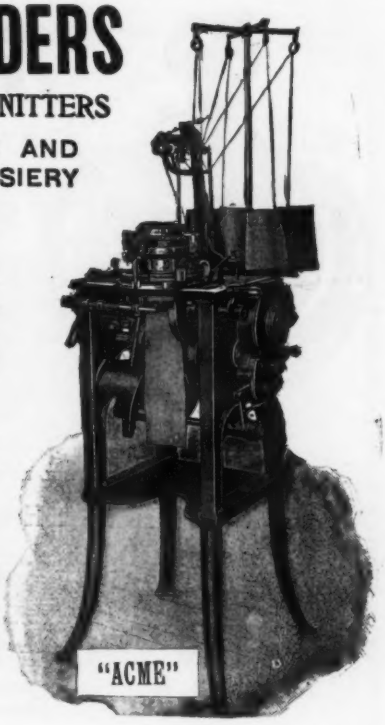

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WITH OR WITHOUT

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ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

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Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

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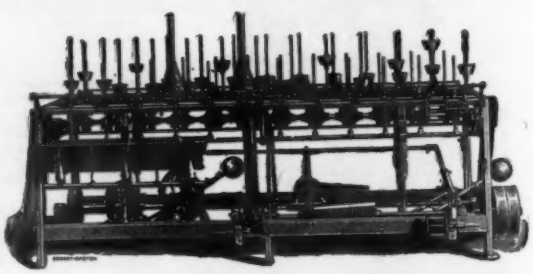
Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



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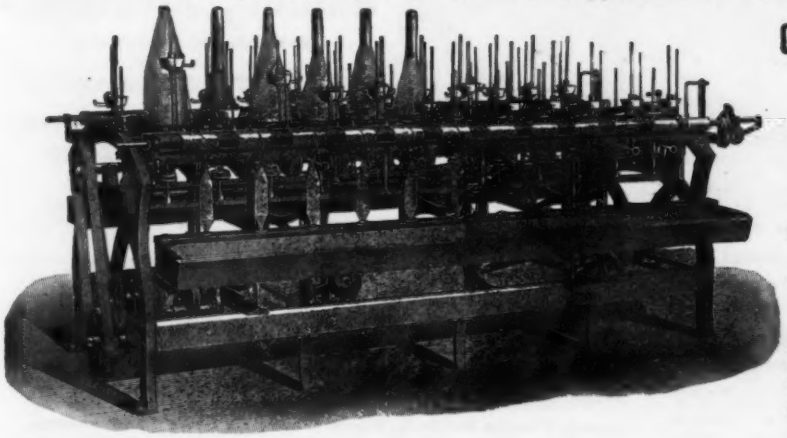

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To Spool from Cop, Skein or Bobbin.

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Sole Agent for United States and Canada

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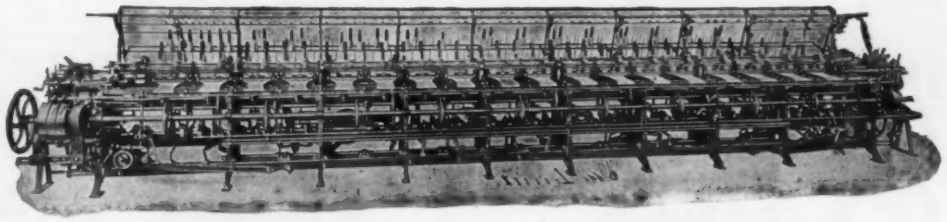

"Awarded Gold Medal at World's Fair, Paris, 1900,

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SPECIALTIES:

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COTTON SYSTEM, for horizontal stripes up to 6 colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.

COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies hose or half hose and dispenses with the foot machine.

COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

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RIB MACHINES: Hilscher System, high construction.

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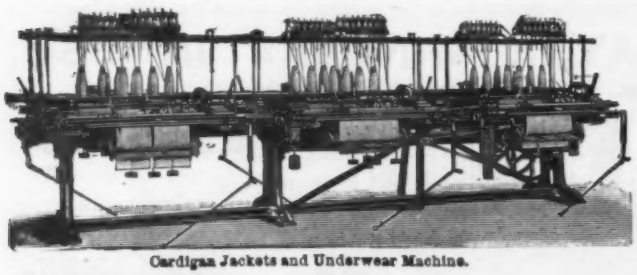

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For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

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DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

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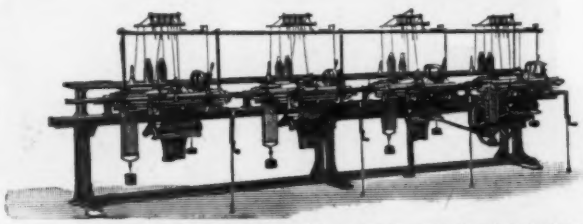

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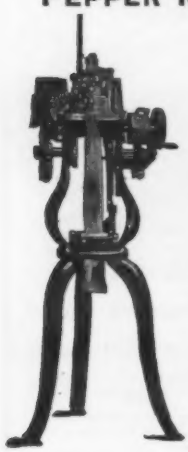

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Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

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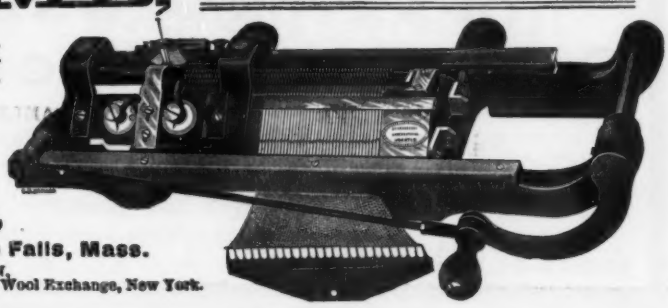

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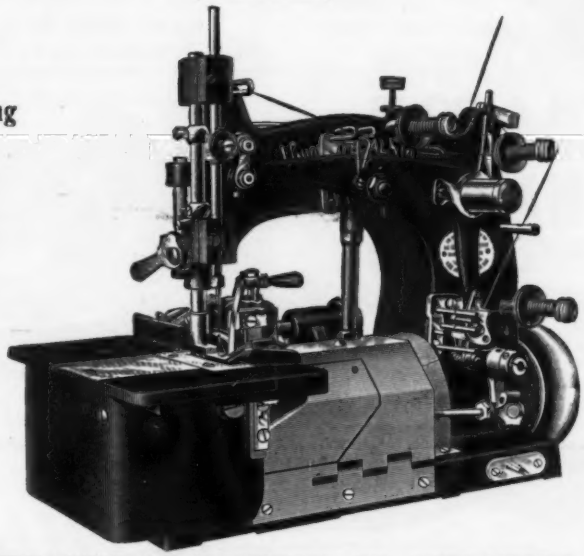
Class 15400 Simplicity **Single "Interlock" Machine** High Speed Durability

(TRADE MARK)

Overedge Seaming and Hemming.



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Two or Three Thread Stitch.

Fabrics of Every Kind.

BY INCREASING PRODUCTION OF OPERATORS, THESE MACHINES REDUCE COST. EXPENDITURE FOR UNION SPECIALS ALWAYS MEANS A PROFITABLE INVESTMENT.

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Full Automatic Knitter

FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.
RANGE ON HALF HOSE AND LADIES FROM 260 NEEDLES DOWN.

3-4 AUTOMATIC KNITTER

With Lace Effects.

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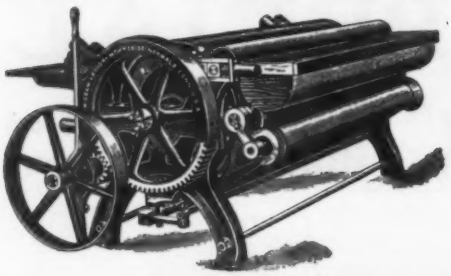
537-39-41 North 3d St., - - - - - PHILADELPHIA.

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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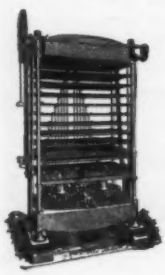

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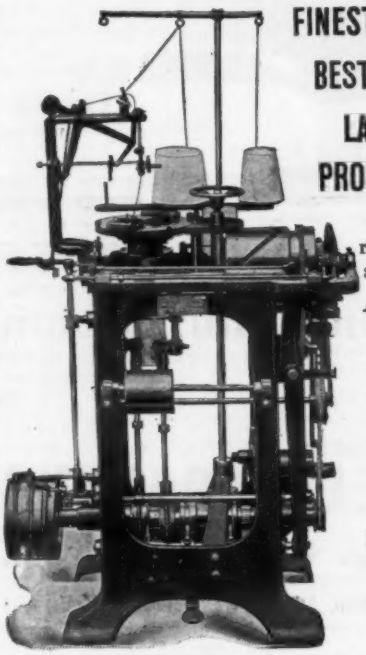

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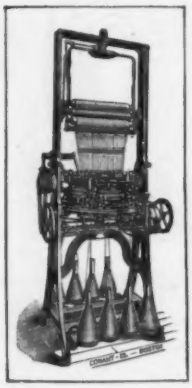

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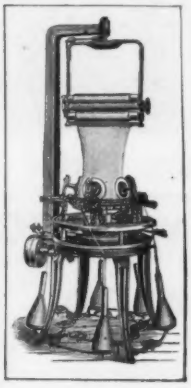

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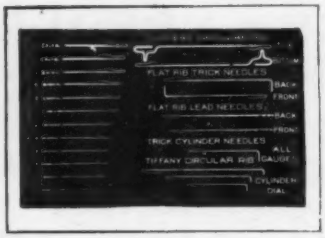

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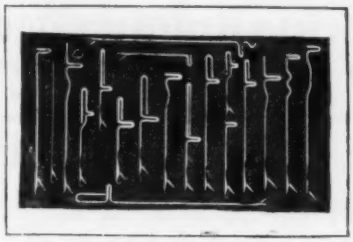

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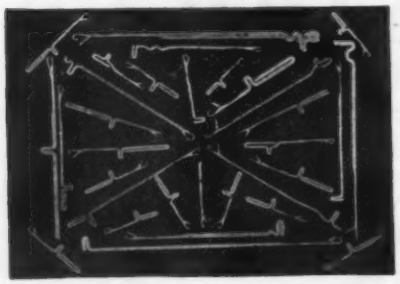

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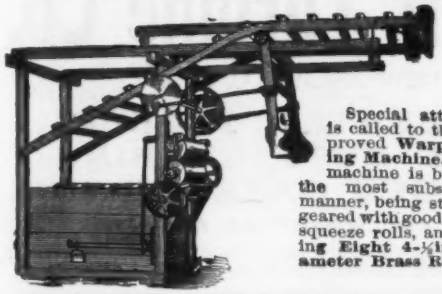
MASSACHUSETTS FAN COMPANY, WALTHAM, MASS.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,
Hedge and Brown Streets, FRANKFORD, PHILA.

Jarrard Needle Works,
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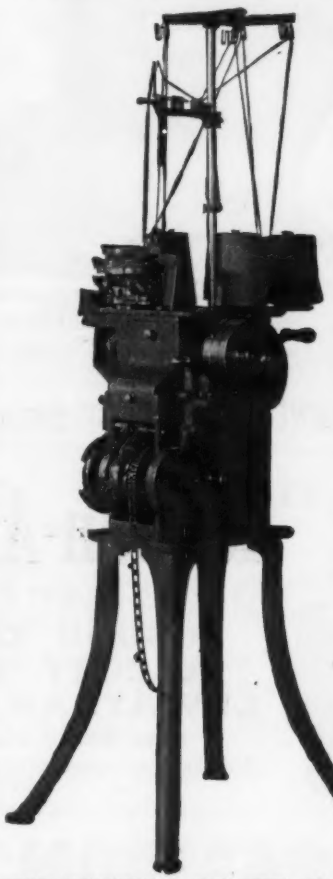
Manufacturers of
Knitting Machine Needles
and Sheet Metal Pressings.

HEMPHILL'S LATEST
"THE BANNER"
FULL AUTOMATIC MACHINE.



CLAIMS

LARGEST PRODUCTION
HIGHEST SPEED
SIMPLEST
LEAST REPAIRS
SIMPLER NEEDLES USED
Specially Adapted to Platted Goods
More Yarn Changes and Greater Variety of Work

THE WONDER OF THE 20th CENTURY.

Manufactured by the

HEMPHILL MANUFACTURING COMPANY
321 PINE ST., PAWTUCKET, R. I.

Boston Wool Exhausters, with Removable Tops.

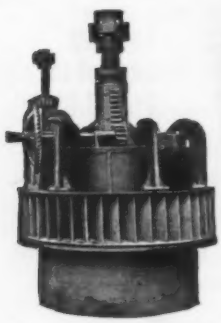
AS USED IN CONNECTION WITH PNEUMATIC CONVEYOR SYSTEM FOR HANDLING WOOL, COTTON, RAGS, EXCELSIOR, JUTE, ETC.

Inlet Side of Right-hand Wool Exhauster. Pulley Side of Left-Hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon=Alcott Turbine Co.

MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE
LEVIATHAN HINGED GATE TURBINE
On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

SAMSON TURBINE

To insure close speed regulation in a turbine it is necessary to have a gate which is easily operated. The gates on our

SAMSON TURBINES

are balanced and consequently moved with the greatest ease.

Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.

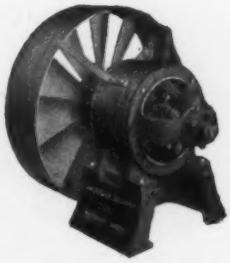
The air is kept pure and temperature comfortable by using

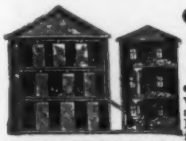
The "ABC" Disc Fans

Strong, Durable, Efficient

American Blower Company

Detroit





CHARLES H. SCHNITZLER,

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED. Patented Oct. 15, 1889.

315 NORTH SECOND ST., - PHILADELPHIA, PA.

W. W. TUPPER & CO., GRATE BARS

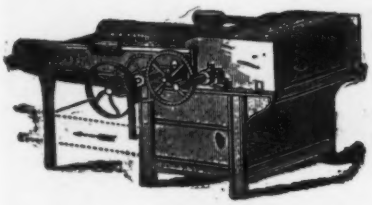
For Any Kind of Fuel.

Rocking Grates—Dumping Grates.

24 State Street, - - - - - - New York.

Geo. W. Gerry & Son, ATHOL, MASS.

MANUFACTURERS OF



Lumpers,

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Rag Dusters, Nappers.

Improved Cloth Measuring Machines.

Lumper and Duster Cylinders Refilled and Repaired.

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4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

Write for Catalogue if contemplating purchase of turbines.

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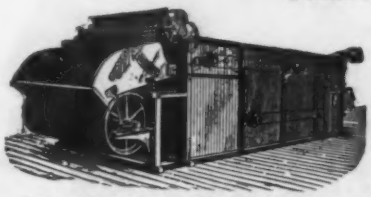
"CYCLONE" DRYERS

For Cotton Stock, Wool Stock, Rags, Yarn, Cloth, Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.

Automatic Yarn Dryer.

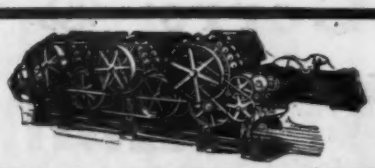
Steel Bladed Ventilating Fans.

Complete Carbonizing Outfits for Wool, Rags or Cloth.

IRON BOWL YARN SCOURING MACHINES.

THE PHILADELPHIA TEXTILE MACHINERY CO.,

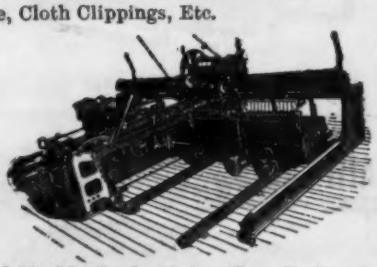
Hancock and Somerset Streets, PHILADELPHIA, PA., U. S. A.



CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.

WOOLEN MILL MACHINERY



Including Rag, Wool and Burr Pickers, Wool, Worsted and Shoddy Cards, Mules, Yarn Twisters, Warpers, Dressers, Spoolers, Etc.

Complete Equipment for Manufacturing Cotton Batting for All Purposes.

Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

SMITH & FURBUSH MACHINE CO., Hancock and Somerset Streets, **PHILADELPHIA, PA., U. S. A.**

THE BUTTERICK TRIO

The Delineator **The Designer** **The New Idea**
Woman's Magazine

More than one million six hundred thousand (1,600,000) homes,—about ten millions of readers. Magazines that pass from hand to hand, and from home to home—among *women,* who buy *at retail stores,* for *families.*

The largest, most efficient, single power for business promotion in the World

The degree of *attention* and *thought* that your Advertising message gets, is just as important to you as the *wording* of your message.

You give much thought to what you *say* in your advertisement. Give a little thought to this:—

An advertisement that speaks to its reader from out of a babel of other advertisments, crowded together *on the same page,* cannot stand the same chance of getting the reader's full attention and earnest thought.

—o—

Compare the page "make-up" of The Delineator, or of The Designer, or of The New Idea Woman's Magazine, with the make-up of any other woman's magazine.

Even if any other magazines did equal their value—(character—quality—quantity—cost)—the magazines of the Butterick Trio would still be better,—because their page make-up gives your advertisement a better chance to be seen, to be read, and to put your business message into the reader's mind.

—o—

No other magazine gives its advertisers such advantageous positions as the Butterick Trio,—(without pledging position),—gives to the users of its advertising columns.

—o—

I ask you to take up any other magazine that is published,—place it side by side with The Delineator,—or The Designer,—or The New Idea Woman's Magazine—and, as an Advertiser, compare the make-up of the advertising pages.

I want you to convince yourself that, even if circulation and price figured out to the same *arithmetical* value,—the better layout and make-up of the Butterick Trio magazines gives you (at the same or smaller cost) an advantage which adds twenty to fifty per cent. to the *actual* value of your advertising space.

W. H. Black

ADVERTISING MANAGER.

THE BUTTERICK TRIO

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FIRST NATIONAL BANK BUILDING

NEW YORK,
BUTTERICK BUILDING

Talk it over with your Agent He Knows.

Foster Machine Company

WESTFIELD, MASS.

BUILDERS OF

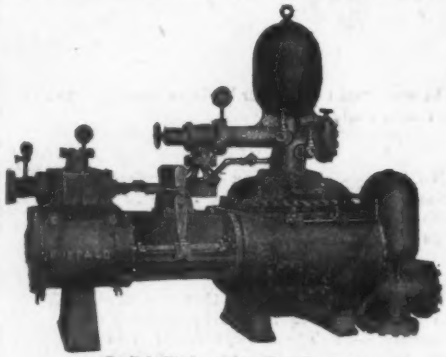
CONE AND TUBE WINDERS

Both Close and Open wind.

Our Machines are in use in Cotton, Wool, Worsted, Silk and Linen Mills.

The FOSTER WIND CONE makes a Perfect Knitting Package.

BUFFALO PUMPS



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FIRE PROTECTION

When danger threatens an added security is felt by the mill or factory owner whose fire fighting system includes a Buffalo Underwriter Pump.
Built throughout from new patterns in strict conformity to the 1904 specifications.

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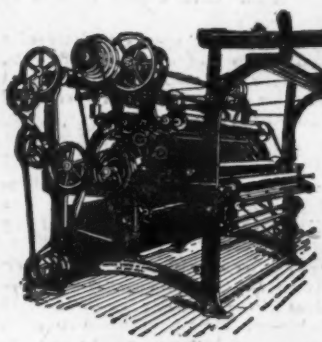
THE AMERICAN NAPPING MACHINE CO.

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on exhibition and Samples Napped at North Andover, or Williamstown, Mass., on application to any of the following offices:

Davis & Furber Machine Co.,
Builders and Selling Agents, ... North Andover, Mass.
Geo. S. Harwood & Son, 53 State St., Boston.
H. H. HEAP, Treasurer and General Manager
WILLIAMSTOWN, MASS.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
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